DOCUMENT RESUME

ED 356 371 CE 063 456

TITLE	U.S. Needs to Effectively Compete in High-Technology Markets. Hearing before the Subcommittee on Energy and the Subcommittee on Technology and Competitiveness of the Committee on Science, Space, and Technology. U.S. House of Representatives, One Hundred Second Congress, Second Session.
INSTITUTION	Congress of the U.S., Washington, DC. House Committee on Science, Space and Technology.
REPORT NO	ISBN-0-16-039468-6
PUB DATE	28 Aug 92
NOTE	78p.; Contains some small light type.
AVAILABLE FROM	U.S. Government Printing Office, Superintendent of Documents, Congressional Sales Office, Washington, DC 20402.
PUB TYPE	Legal/Legislative/Regulatory Materials (090) -- Viewpoints (Opinion/Position Papers, Essays, etc.) (120)
EDRS PRICE	MF01/PC04 Plus Postage.
DESCRIPTORS	Competition; Dislocated Workers; *Economic Development; Educational Improvement; Educational Needs; Federal Government; *Federal Legislation; Federal Programs; *Futures (of Society); *Government Role; Hearings; *Job Training; Postsecondary Education; Problem Solving; Secondary Education; State Programs; *Technological Advancement
IDENTIFIERS	Congress 102nd

ABSTRACT

This document records the oral and written testimony of witnesses at a Congressional hearing on U.S. needs for training in high technology areas. Testimony was given by local officials, corporate officials, a union representative, and two professors of engineering from universities in Indiana. Testimony centered on jobs and job training, reforming the education system, and international competition. Witnesses testified that government regulations that cause excess paperwork and prevent industries from being competitive should be changed. They also talked about the burdensome health care system that saps productivity with ever-rising costs as well as the need for workers to learn new skills. Skills in life management, conflict resolution, cooperation, and problem solving were advocated for workers. Witnesses also advocated more cooperative problem solving and strategizing by the various sectors of the economy. (KC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. NEEDS TO EFFECTIVELY COMPETE IN HIGH-TECHNOLOGY MARKETS

ED356371

HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY

AND THE

SUBCOMMITTEE ON TECHNOLOGY AND COMPETITIVENESS

OF THE

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY U.S. HOUSE OF REPRESENTATIVES

ONE HUNDRED SECOND CONGRESS

SECOND SESSION

AUGUST 28, 1992

[No. 150]

Printed for the use of the
Committee on Science, Space, and Technology

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☐ This document has been reproduced as received from the person or organization originating it
☐ Minor changes have been made to improve reproduction quality
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy

U.S. GOVERNMENT PRINTING OFFICE
59-967 cc WASHINGTON : 1992

For sale by the U.S. Government Printing Office
Superintendent of Documents, Congressional Sales Office, Washington, DC 20402
ISBN 0-16-039468-6

CE063456

2 BEST COPY AVAILABLE

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

GEORGE E. BROWN, JR., California, *Chairman*

JAMES H. SCHEUER, New York
MARILYN LLOYD, Tennessee
DAN GLICKMAN, Kansas
HAROLD L. VOLKMER, Missouri
HOWARD WOLPE, Michigan
RALPH M. HALL, Texas
DAVE McCURDY, Oklahoma
NORMAN Y. MINETA, California
TIM VALENTINE, North Carolina
ROBERT G. TORRICELLI, New Jersey
RICK BOUCHER, Virginia
TERRY L. BRUCE, Illinois
RICHARD H. STALLINGS, Idaho
JAMES A. TRAFICANT, JR., Ohio
HENRY J. NOWAK, New York
CARL C. PERKINS, Kentucky
TOM McMILLEN, Maryland
DAVID R. NAGLE, Iowa
JIMMY HAYES, Louisiana
JERRY F. COSTELLO, Illinois
JOHN TANNER, Tennessee
GLEN BROWDER, Alabama
PETE GEREN, Texas
RAY THORNTON, Arkansas
JIM BACCHUS, Florida
TIM ROEMER, Indiana
ROBERT E. "BUD" CRAMER, Alabama
DICK SWETT, New Hampshire
MICHAEL J. KOPETSKI, Oregon
JOAN KELLY HORN, Missouri
ELIOT L. ENGEL, New York
JOHN W. OLVER, Massachusetts

ROBERT S. WALKER, Pennsylvania*
F. JAMES SENSENBRENNER, JR., Wisconsin
SHERWOOD L. BOEHLERT, New York
TOM LEWIS, Florida
DON RITTER, Pennsylvania
SID MORRISON, Washington
RON PACKARD, California
PAUL B. HENRY, Michigan
HARRIS W. FAWELL, Illinois
LAMAR SMITH, Texas
CONSTANCE A. MORELLA, Maryland
DANA ROHRABACHER, California
STEVEN H. SCHIFF, New Mexico
TOM CAMPBELL, California
JOHN J. RHODES, III, Arizona
JOE BARTON, Texas
DICK ZIMMER, New Jersey
WAYNE T. GILCHREST, Maryland
SAM JOHNSON, Texas
GEORGE ALLEN, Virginia

RADFORD BYERLY, JR., *Chief of Staff*
MICHAEL RODEMEYER, *Chief Counsel*
CAROLYN C. GREENFELD, *Chief Clerk*
DAVID D. CLEMENT, *Republican Chief of Staff*

SUBCOMMITTEE ON ENERGY

MARILYN LLOYD, Tennessee, *Chairman*

JERRY F. COSTELLO, Illinois
RALPH M. HALL, Texas
TERRY L. BRUCE, Illinois
RICHARD H. STALLINGS, Idaho
JAMES A. TRAFICANT, JR., Ohio
ROBERT E. "BUD" CRAMER, Alabama
HOWARD WOLPE, Michigan
TIM ROEMER, Indiana

SID MORRISON, Washington
HARRIS W. FAWELL, Illinois
LAMAR SMITH, Texas
STEVEN H. SCHIFF, New Mexico
JOE BARTON, Texas

SUBCOMMITTEE ON TECHNOLOGY AND COMPETITIVENESS

TIM VALENTINE, North Carolina, *Chairman*

DAN GLICKMAN, Kansas
NORMAN Y. MINETA, California
ROBERT G. TORRICELLI, New Jersey
RAY THORNTON, Arkansas
TIM ROEMER, Indiana
JOAN KELLY HORN, Missouri
RICK BOUCHER, Virginia
JOHN TANNER, Tennessee
JIM BACCHUS, Florida
DICK SWETT, New Hampshire
ELIOT L. ENGEL, New York
JOHN W. OLVER, Massachusetts

TOM LEWIS, Florida
DON RITTER, Pennsylvania
PAUL B. HENRY, Michigan
DANA ROHRABACHER, California
TOM CAMPBELL, California
WAYNE GILCHREST, Maryland
CONSTANCE A. MORELLA, Maryland

---

*Ranking Republican Member.

CONTENTS

WITNESSES

	Page
August 28, 1992:	
Stephen M. Queior, President, St. Joseph County Chamber of Commerce; Craig MacNab, Director, Public Relations, AM General Corporation, South Bend, Indiana, and Frank Scharpf, Director, Business Planning, AM General Corporation	6
Dave Perkins, Business Representative, International Association of Machinists and Aerospace Workers	35
Dr. Dan Tomal, Purdue University, Technology Engineering Department and, Dr. Anthony Hyder, University of Notre Dame, Associate Vice President of Research and Professor of Aerospace Engineering	47

U.S. NEEDS TO EFFECTIVELY COMPETE IN HIGH-TECHNOLOGY MARKETS

FRIDAY, AUGUST 28, 1992

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY; SUBCOMMITTEE ON ENERGY; AND THE SUBCOMMITTEE ON TECHNOLOGY AND COMPETITIVENESS,
Washington, D.C.

The Subcommittees met, pursuant to call, at 9:14 a.m. in the Elkhart Area Career Center, Elkhart, Indiana, Hon. Tim Roemer presiding.

Mr. ROEMER. This Committee will now come to order.

I would first like to start off by thanking our panelists which we will have three different panels today; our business community, our labor community and our university community, to talk and to testify about our work force and our competitiveness and our job training programs and our education system.

But before I get into that, in welcoming our distinguished panelists today in what I am sure in reading through their testimony is superb testimony, I want to thank Steve Borleski with the Committee for taking time to come in from Washington, D.C., and although Chairman Brown, the Chairman of the full Committee is not with us today, nor is Marilyn Lloyd, the Chairperson of the ranking Subcommittee with jurisdiction over this matter, I would like to extend my thanks to them as well too. Furthermore, to the great facilities here in Elkhart at the Career Center that is providing such a valuable service to our community here to help young people in high school get sufficient skills to contribute to the economy right away, to help with retraining programs when somebody has been dislocated, to get new skills and then go back into the economy and contribute right away as well too.

We are going to talk about a number of things here today, but I think what is most important to talk about is to talk about what is important to the American people in the 1990s, and that is jobs and job training. People are very worried about their own jobs and about their children's prospects for jobs. And our panelists will be talking in a variety of ways about what do we do to bring those jobs into this community, to maintain the jobs that we have, to make sure that these jobs pay our workers a good wage that then they can contribute to this economy by going to our restaurants and going when they are sick to our hospitals and using our banking and financial system to keep our economy rolling along.

I also think that we will be talking a lot about the education system in this country. How do we turn the education system upside down and then therefore right side up, so that businesses do not have to spend $30 billion a year on new schools in their factories, but they can spend some of that money on new intern and apprenticeship programs with the schools, as some of our panelists will talk about today. Many of the innovative programs that they already have going.

Also we are going to talk a little bit about international competition. You pick up any best selling book list and you see what Americans are reading about. They are reading about how America is going to compete today with the Japanese and the Germans, whether that is the best-selling *Head To Head* by Lester Thurow or whether that is written by a businessman *In The Shadow of the Rising Sun*, a CEO of a steel company in Pittsburgh. What can we do, not just to insist on fair trade with the Japanese and the Germans, what can we do in America to make sure that we are preparing our work force for the future, that we are having our universities get out of the ivory tower and help us develop products for our factories; the high-definition television of the future, the ceramic engine of the future. These are concerns that we have answers to here in northern Indiana, another reason why this committee needs to get out of Washington, D.C. and come to Indiana and listen to the common sense practice by Hoosiers in this state.

And I guarantee you that this testimony will be read by people like Chairman Brown, by people like Chairperson Marilyn Lloyd, by Democrats and Republicans on the committee. We are searching for new, innovative solutions to the old problems that nag at us for a competitive work force, for an educated work force, for a good university system that participates with our business and for a government that doesn't look to penalize jobs, that looks to work with our labor and our business communities.

We will have the first panel, the business community, talk about a host of different ideas, developing new technology, education, worker training programs. We will have the second panel, the labor community, talk about again, the importance of high-wage, high paying jobs, health care, innovative solutions for health care. And then we will have the university panel come in and talk about ways by which universities like Purdue and Notre Dame and Goshen and IUSB and IB Tech can also help our business and labor community with jobs.

Before I recognize our distinguished panelists, I would like to make sure that testimony from Mr. George Hofmeister is entered into the record, and I ask unanimous consent that all of his testimony appear in the record as if read.

[The prepared statement of Mr. Hofmeister follows:]

EWI Inc.

100 South Broadway Avenue
Salem, Ohio 44460
(216) 337-1113
Fax (216) 337-1119

August 21, 1992

Mr. Tim Valentine
Chairman
Subcommittee on Technology
and Competitiveness

Ms. Marilyn Lloyd
Chairman
Subcommittee on Energy

U.S. House of Representatives
Committee on Science, Space
and Technology
Suite 2320 Rayburn House Office Building
Washington, DC 20515-6301

Dear Chairmen:

Thank you for inviting me to address the joint subcommittees on U.S. industries needs to effectively compete in high technology markets. Although I will not be able to present my thoughts in person, I do want to address certain key issues which are essential for the competitive position of U.S. manufacturing companies.

U.S. manufacturing companies have labored under government directed, adverse conditions for the past three decades. Overall worldwide economic growth and U.S. domestic economic growth were strong enough in the past to mask these economic deterrents. I will characterize the deterrents as:

1. Burdensome regulations and paperwork;
2. Tax disincentives for capital investments;
3. Lack of proper direction in education;
4. Lack of sources of capital; and
5. Unrealistic rules in order to compete with foreign companies.

If the United States is to remain a leading economic power in the new world order, we must address the above shortcomings. I propose that Congress work to:

1. Reduce excess paperwork and regulations;
2. Provide an investment tax credit on new equipment purchases;
3. Provide for accelerated depreciation on production machinery and equipment;
4. Allow increased retirement savings deductions;
5. Encourage personal family savings by providing an interest income deduction;
6. Direct financial regulators to provide more flexible credit with longer repayment terms for productive asset investment;

EWI Inc.
SOUTH BEND STAMPING DIVISION

7. Allow competitors to work with each other on customer opportunities; and
8. Streamline the education process to provide more skilled training in the hard sciences and mathematics.

We must have a national vision in order to stay a leader in industrial output. Industrial manufacturing jobs provide a good living standard for workers. Job statistics are very misleading, because they deal with numbers of workers instead of, more importantly, wages earned. Manufacturing jobs provide high wages and benefits and allow a high standard of living for the worker and his family.

Manufacturing companies must be able to access available credit at rates and payment terms that allow them to compete with a global economy. The federal government can direct that policy through control of federal regulations.

Federal government should not be in the business of development of new technologies because the bureaucratic system is not efficient. Significant research and development credits should be maintained through the tax code to encourage private corporations and entrepreneurs to develop new ideas.

Our company established a GED program shortly after start-up. We have graduated our first three high school equivalent employees. It is absolutely essential that today's work force be educated in order to properly man the sophisticated equipment used in manufacturing today and in the future. The education and training level of our workers ranks us about 20th world-wide. If that is allowed to continue, the U.S. will lose its competitive edge in the global economy.

Summary:

We must generate a highly educated work force capable of running very sophisticated, computerized equipment. We must take politics out of industrial policy and allow U.S. industry to modernize and compete against savage global competition. A manufacturing job at $10 plus an hour is far more desirable than a fast-food job at minimum wage. We can only maintain our standard of living and our dominant place in the world economy by taking the above actions.

Sincerely,

George S. Hofmeister
Chairman & CEO

GSH/kb

EWI Inc.
SOUTH BEND STAMPING DIVISION

GEORGE S. HOFMEISTER

President & CEO

CPA, MBA Finance and Accounting, Indiana University, BS Business Administration, Ohio State University. Mr. Hofmeister is the Chairman and Chief Executive Officer of EWI, Inc. and American Metals Industries, Inc., (AMI). Prior to forming AMI, Mr. Hofmeister was the Chairman and Chief Executive Officer of Alliance Machine Company, Inc., Alliance, Ohio (AMCO), a manufacturer of hot metal cranes, steel mill equipment and specialty engineered equipment for the steel and aluminum industries. Mr. Hofmeister acquired AMCO in 1987, at a time when it was losing $400,000 a month and made it cash flow positive within six months. AMCO was sold in 1989. From 1984 to 1987, Mr. Hofmeister was President of Ramsay Hofmeister, Inc., a financial consultant to steel companies. From 1981 to 1984, Mr. Hofmeister was Executive Vice President of Tubular Corporation of America, Inc., Muskogee, Oklahoma, a seamless tubular processor, where his duties included responsibility for financial, contract, accounting, purchasing, legal, personnel, corporate policy and strategic planning. Prior to that, Mr. Hofmeister was a Tax Manager with Price Waterhouse from 1976 to 1981, based in Chicago, Illinois and Pittsburgh, Pennsylvania.

601 W. BROADWAY • SOUTH BEND, INDIANA 46601 • (219) 287-7253 • FAX (219) 282-8293
MAILING ADDRESS: P.O. Box 990 • SOUTH BEND, INDIANA 46624

Mr. ROEMER. I also—in welcoming our distinguished panelists to this hearing, I will tell you that your testimony, your excellent testimony and well-prepared testimony will be entered into the record as if read. Every word will be in the Washington hearings and available for all Committee Members and Members of Congress, so if you feel comfortable reading your testimony, feel free to do that. If, however, you feel like you want to concentrate on two or three different ideas; if you want to, then in the question and answer period engage in kind of a colloquy for some different ideas, please feel very comfortable to do that in a leisurely and relaxed setting here. We are here to learn from you, to engage you, to have some new ideas entered into this record, so please feel that all of your testimony is entered in there and if you want to be a little bit more off-the-record and off-the-cuff here, please feel free to do that.

Let me welcome first of all Mr. Steve Queior with the St. Joseph County Chamber of Commerce. We are looking forward to first of all your testimony. You will start and begin first and I will welcome the other panelists when you finish your testimony. So, Steve, if you'd like to start.

STATEMENTS OF STEPHEN M. QUEIOR, PRESIDENT, ST. JOSEPH COUNTY CHAMBER OF COMMERCE; CRAIG MACNAB, DIRECTOR, PUBLIC RELATIONS, AM GENERAL CORPORATION, SOUTH BEND, INDIANA AND FRANK SCHARPF, DIRECTOR, BUSINESS PLANNING, AM GENERAL CORPORATION

Mr. QUEIOR. Thank you very much for this opportunity and introduction. I think I will proceed with a combination, Congressman, a blend of reading part of the printed testimony and offering a few more thoughts, particularly in the challenging area of education, work force training and bringing all that together to the best result.

My position as President of the Chamber of Commerce of St. Joseph County—that's a business membership organization of 1450 member firms, and those firms do employ over 75,000 workers, so we relate very strongly to the things you were mentioning about job security, high quality jobs, jobs that provide a level of compensation for good quality of American life.

Before specifically making a comment or two on research and development and expanding a bit on the work force education and training type of issues, there are four other critical areas that I would just like to briefly list and mention. A preliminary comment or two about education and training, the second category being regulations and responsiveness of government; the environment, number three, and international trade, number four.

In the first education and training area, we see that the challenge is so great for international competition, that as you indicated, major changes may be needed. Certainly one avenue of possible improvement lies in technology. Improving and expanding pedagogical technology, if you will, one idea beyond the normal four-wall school room being community learning centers and in fact, we have discussed the possibility of community learning centers in St. Joseph County in a variety of different physical type of locations with innovative coalitions coming together for life-long learning op-

portunities that I would be happy to describe a little more at the end.

Secondly, the national America 2000 goals do provide a consistent foundation where from community to community we can compare programs to meet the same goals that I think should be emphasized and supported.

The second area of the four, in terms of trying to make government more responsive, a couple of sub-areas there would include government contracting and our Chamber of Commerce hosts an office that helps small and medium-size businesses particularly, to get government contracts which has been successful in providing good jobs, manufacturing jobs, by bringing government contracts back to northern Indiana. However, we see the possibility of the federal government using less costly, more commercial styled procurement practices, although the experts are sitting next to me here, and increasing the possibility for off-the-shelf product purchase, if you will.

Product liability is a concern for American businesses, and some legislation there that would reduce litigation or simplify in terms of consistency, paperwork reduction has been attacked once before and we feel could be attacked again to reduce burdens there.

And uniformity of law is an issue for businesses and a barrier for interstate commerce where the federal government could play a positive role in creating more uniformity in reducing the conflict and confusion between varying local and state laws dealing with production and commerce.

The third area, environment and natural resources; I think the consensus of business is that this is certainly a very important area, but that the greatest opportunities for America are in market driven solutions. That is what has brought us to our economic might to this date over 200 years and continues to meet challenges for us, and t hat decisions be based on sound scientific evidence so that limited resources can be invested to their best result in what are very costly environmental issues.

Related to the environment is the opportunity to better define a national energy policy which affects all types of major capital investment decisions from the manufacturing end right down to consumer products and quality of life.

The fourth area; in order to succeed in international markets even more than America does now, we see strengthening the export/import bank as key, and possibly working through the U.S. Department of Commerce and other agencies to increase assistance to help businesses develop joint ventures as well as reverse investment and other types of economic activity. The joint venture model seems to be really growing now in our world economy and all the help we can get to establish those around the world and create more jobs back here in the U.S. is key.

I know that research and technology is a key concern of the Committee and there, I think it is necessary to collaborate more between business, government and academia. There actually is a positive model that has been commented favorably on in the Department of Defense, Advanced Research Projects Agency that helps bring things from the federal labs to the marketplace, and an

idea that we would suggest is looking at a civilian counterpart for that for other types of federal research.

There are some other things in the research and development area; intellectual property protection, if that can be strengthened; promotion of different consortia that can come together and work on new technologies. The research and development tax incentive area is also key for renewal or possible expansion.

The second major thing in the research and technology area has to do with antitrust and coming together either for research, which I believe there was an act passed in 1984 which allowed protection against the treble damage of antitrust, but also for production, and particularly among smaller companies that do not have the resources to do very expensive research and development or build wind tunnels or whatever it is. If some of those limitations could be reduced, in fact smaller businesses are the greatest contributors of new innovations and be the American business small or large, the ability to join together to take on risky research or expensive new technology ventures, I think is something that deserves a strong look and could help us compete with Japan and Germany and so forth, who are investing, according to different studies, up to twice the relative amount of funds in R&D and new technologies.

That all said, I would just finish with a few comments about some local initiatives in this difficult equation of education, training and work force preparation. It is extremely challenging, we are dissatisfied now with our drop-out rates, yet they are half of what they were 20 or 30 years ago. But the agriculture labor market has shrunk because of our great technology there. The ability to go in and perform one function on a lathe in South Bend and earn a good living for 40 years in a row is gone, to do the repetitive function. So the jobs of the 1990s and beyond are much more difficult and therefore require new entrants into the labor force being much more prepared and existing workers to be able to be retrained up to five times in their career. And what we have found is a patchwork quilt at best between the different forces. And to try to overcome that, we have created an organization called CONNECT, that brings together business people, education, training people and human service people where there are, we have found, tremendous issues of day care and health and transportation that without solving those to the minimum standard, there's no hope of good education and work force preparation.

So any support from the federal level that might help us experiment with new ideas, new school to work transition programs and new coalitions basically is what we think it will take to make the necessary improvements in the work force, would be much appreciated.

Mr. ROEMER. Thank you, Steve, for that excellent testimony. And we will come to questions after all three panelists are done.

I would like to also welcome Mr. Craig MacNab, who is the Director of Public Relations with a company that we affectionately refer to as the Hummer here in northern Indiana. Craig, if you would give your testimony, we would much appreciate it. Good to see you.

[The prepared statement of Mr. Queior follows:]

THE CHAMBER OF COMMERCE
OF St. Joseph County

TESTIMONY TO COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES
AUGUST 28, 1992 IN ELKHART, INDIANA

TESTIMONY MADE BY STEPHEN M. QUEIOR, CCE
THE CHAMBER OF COMMERCE OF ST. JOSEPH COUNTY

ISSUES CRITICAL TO THE ABILITY FOR U.S. INDUSTRY TO
COMPETE IN HIGH TECHNOLOGY AND OTHER MARKETS

Good morning...thank you for this opportunity. The Chamber of Commerce of St. Joseph County is a business membership organization that is composed of 1,450 member firms. These enterprises employ over 75,000 workers, primarily in the greater South Bend/Mishawaka/St. Joseph County area, but also in other communities of the Third Congressional District of Indiana and in Southwestern Michigan.

The following comments are based on feedback from those member firms, and also include recommendations drawn from policy positions taken by our Chamber's broad and diverse Board of Directors and other business and development organizations.

Before more specifically addressing research, development, and technology transfer priorities, allow me to highlight several additional issues that my organization's members indicate are critical to their success, in fact, are necessary for their survival in this ever increasingly competitive global marketplace. Our areas that have repeatedly been presented as critical to the viability of area businesses, and to their capacity to provide quality jobs at desirable levels of compensation are the following:

Commerce Center ▮ 401 E. Colfax Ave., Suite 110 ▮ P.O. Box 1677 ▮ South Bend, Indiana 46634-1677 ▮ 219-234-0051 ▮ FAX: 219-282-4700
South Bend ▮ Mishawaka ▮ Granger ▮ Osceola ▮ New Carlisle ▮ North Liberty ▮ Chamber ▮ Knox and ▮ Argentine

1. Education and training;
2. Regulations and the responsiveness of government;
3. The environment; and
4. International trade assistance.

To comment briefly on each of these four:

CHALLENGE #1 - The present system of public education is producing [illegible] poorly equipped to contribute effectively to the maintenance of a viable and growing economy or to help the United States compete in international markets.

GOALS:

1. Promote education technology as a highly effective pedagogical tool for learners of all ages. Obtain financing for pilot implementation of technological learning systems - to be known as Community Learning Centers - which employ the latest technology and area available to learners of all ages.

2. National Implementation of the America 2000 Strategy - America 2000 is a viable mechanism for improving education through programs modeled after the national education goals. The strategy has a strong state and local focus, and calls upon business to play a leadership role. All efforts should be made for local communities to support and implement the reforms proposed in this strategy.

CHALLENGE #2 - MAKING GOVERNMENT MORE RESPONSIVE

GOALS:

1. Federal Government Contracting: Procurement/Acquisition - Secure the simplification and streamlining of the federal government contracting process through legislative and/or regulatory reforms. Key features of such initiatives will include: 1) the federal government's use of less-costly, commercial-style procurement practices and 2) increased purchasing of "off-the-shelf" commercial products.

2. Litigation and Product Liability - Obtain legislative and judicial reforms to control costs of litigation and excessive liability claims.

3. Paperwork Reduction - Secure enactment of a Paperwork Reduction Act which will reduce costly, burdensome federal paperwork and reporting requirements.

4. Pre-Emption/Uniformity of Law - Facilitate interstate commerce by securing enactment of legislation which pre-empts certain conflicting or non-uniform local and state laws, targeting those areas in which the proliferation of differing regulations has created barriers to interstate trade.

CHALLENGE #3 - ENVIRONMENT AND NATURAL RESOURCES

GOALS:

1. Environment: Solid Waste, Water Quality, Global Climate Change - Secure enactment of legislative initiatives which provide for environmentally sound, market-driven solutions to problems of solid-waste management and water-quality improvements. Such legislation should be based upon sound scientific evidence and incur the least possible economic cost.

Page Four

2. National Energy Policy - Secure enactment of energy legislation that promotes development and distribution of adequate supplies of energy at affordable prices.

CHALLENGE #4 - SUCCEEDING IN INTERNATIONAL MARKETS

GOALS:

1. Export Enhancement Objective - To increase US exports, secure the strengthening of the Export-Import Bank and the expansion of public/private cooperation in export promotion, and help make foreign assistance more supportive of US business interests.

ACTION NEEDED - Secure increased appropriations for Eximbank programs, including establishment of a $200 million mixed-credit facility; establish more seminars or programs on foreign cultures and business practices to assist area businesses in entering and competing in a global market; and create a additional mechanisms promoting joint ventures, as well as assisting area businesses in the establishment of joint ventures or other joint relationships.

Moving to a priority topic for your hearing, RESEARCH AND TECHNOLOGY:

GOALS:

1. Business/Government Cooperation Objective - Encourage collaboration and cooperation among business, government, and academic institutions in the development of technologies and production processes.

PROBLEM By several measures, the United States is failing to generate new products and production processes at a rate and quality equal to the demands of the world market.

ACTION NEEDED Promote creation of a civilian counterpart to the Defense Department's Defense Advanced Research Projects Agency, to focus efforts on "lab-to-market" initiatives by

business. Secure the strengthening of intellectual-property protection here and abroad. Promote the development of industry-led, government-supported consortia to develop new technologies and processes. Pursue streamlined antitrust laws as needed to encourage more joint Research and Production in costly areas. Restore and increase Research and Development tax incentives.

2. Production Joint Ventures Objective

PROBLEM - Manufacturing industries in the United States are presently constrained from making strategic investments in capital-intensive projects. Particularly with respect to high-technology ventures, US firms face a number of critical problems in this area. While these problems include short product life-cycles and a high cost of capital, particularly burdensome are restrictions under existing law that actively discourage companies from pooling resources and sharing risks.

ACTION NEEDED - Secure amendments to the National Cooperative Research Act of 1984 to give manufacturing/production joint ventures similar treatment under the antitrust laws as now accorded Research and Development joint ventures.

While the nearly $75 billion federal R&D budget is certainly substantial, more than half is still defense related, and often not translatable to business and consumer products or markets. In terms of civilian-related R&D, the Organization for Economic Cooperation Development shows Japan investing 5% of its corporate sales, Germany 6%, and the United States only 3.6%, a situation that could be helped by strengthening R&D tax incentives.

Authors of a new book called "Beyond Spin-Off: Military and Commercial Technologies in a Changing World," suggests three steps for the government: do more to

educate companies about existing technologies; build an infrastructure of test facilities (such as wind tunnels) that many companies can't afford; and support more R&D in generic path-breaking technologies, such as automation, robotics, and materials research. They note that "In order for the government's technology investments to be truly fruitful, they need to be in tune with the technology needs and investments of private industries."

Lastly, business is encouraged by some of the proposed federal R&D expenditures in the 1993 federal budget. We encourage your continuation of such projects as high-speed data lines linking universities, government labs, and industry; the monies being invested in advanced materials and processing research, and the funds targeted for advanced manufacturing research and technology.

Again, thank you for this opportunity to present some of businesses priorities as you face the difficult challenge of establishing federal policy and allocating limited resources.

Mr. MACNAB. Thank you, Congressman Roemer. Like Steve, I will probably do a combination of basing my remarks on what I've prepared and expanding on them from time to time.

As we look, at AM General Corporation, at the economic challenges that face us at this moment in history, we face two great economic challenges. Probably many, many smaller ones, but two big ones. As a defense contractor and the manufacturer of the Hummer high-mobility, multi-purpose wheeled vehicle, our very, very successful and acclaimed wheeled vehicle; we have to confront the potential reduction in military requirements for our products that come with the end of the cold war and the realignment of America's defense posture for the end of this century, the beginning of the next. It is not clear what all the implications of that are as we realign our national posture, but there are implications and we have to deal with that because the United States government is our principal customer. That's a position we're very proud to be in, but it makes for special concerns in the marketplace.

Our second challenge is that we share with all businesses the awesome problem of the spiraling cost of health care, which consume all our improvements in productivity and eat up resources which might otherwise be devoted to the improvement of other aspects of worker life, which would provide for growth in the company for capital investment. When all our resources are going into a constantly increasing health care challenge, that is a very, very serious challenge, and I believe it's one that is in no way unique to us as a defense contractor, but rather is shared by all businesses. We do not offer any solution to that very difficult problem.

Mr. ROEMER. Well we were hoping you would and solve all the problems, Craig.

Mr. MACNAB. I would say with great emphasis that any program to deal with health care that imposes additional burdens on businesses like ours is not the answer. As we struggle for that answer, I think we have to take into account that we need to find a solution of the problem of increasing health care costs. If that solution imposes further burdens on American businesses, it is not the right answer. I feel that very passionately. But that is a very real threat that hangs over all our heads and we certainly need to find some answer to it.

Moving to a happier subject, the conversion of the Hummer to a civilian vehicle, the entry of our product into the civilian marketplace, we think makes us a leading example of the necessary adjustments that have to be made in the American defense industry in dealing with the new position of the country, and happily we do not have to beat our swords into plow shares because we make a plow share. It is a matter of adjusting some of the details of the plow share and painting it a different color. But it is an important—it gives us an advantage.

We make a vehicle that is unlike any other on the face of the earth, but that is in essence a superb pickup truck that will go anywhere and carry an incredible load and last for a very, very long time under the most difficult circumstances. That kind of tool has applications in this country in the civilian world, in the government world outside the military and around the globe, and that provides great opportunities for us, great challenges, because we

enter as we do that into an area where there are no clearly marked pathways in many cases. We are doing something that sometimes sounds like things that have been done before but is in fact in many ways very different. And it certainly, we think, provides an opportunity, many opportunities for government/industry partnership in making that effort. There are tremendous benefits to the American workers that we employ who have the kind of good, high-quality, high-paying jobs that we are talking about and that we want to preserve. Our company provides that kind of employment. It also represents—our capability to manufacture the Hummer, represents a tremendous national asset as part of our industrial base, our defense industrial base, which is very important to the country to preserve.

So our efforts to market the civilian Hummer are beneficial to American workers, they preserve American jobs, they preserve our country's ability to manufacture a vehicle like the Hummer for its defense needs and they also present a wonderful product to users within and without the military, both here at home and around the world.

We have funded the initial engineering conversion to make the military Hummer into the civilian Hummer. But there are many opportunities to apply sophisticated modern automotive technology to the vehicle which remain; anti-lock braking systems, built-in diagnostics, the kind of dual use technology that people are looking for.

I just heard yesterday that there are—there was a reference made to government laboratories a minute ago—that there are government laboratories, tremendously capable government laboratories looking for work. We face engineering challenges, those challenges are in an area where the benefits rebound both to the country and to the company and we think there are tremendous opportunities for the government/industry partnership in applying technology to the Hummer that I referred to a minute ago. That may be the most important message that I bring, is those opportunities are there. The government, as we speak, is looking for places to do that. Here we are.

Mr. ROEMER. Let the record show that he was emphatic with his hand up in the air for that—for those members reading this testimony later on in Washington.

Mr. MACNAB. I have alluded to this in going by, but let me emphasize specifically that the Hummer, as a civilian vehicle, has domestic applications for the government, outside the military, in this country. We are exploring the fringes of that already. There is a prototype Hummer in use with the border patrol, there are three Hummers in the National Park Service's fire-fighting vehicles as I speak, just as a suggestion, a tease, a hint of the potential that exists for government agencies, outside the Defense Department, to make use of this tremendous product. And I would urge the Congress to encourage and facilitate the purchase of this proven vehicle for use by government agencies outside the military in this country. It is sort of an obvious thing and yet there are administrative and bureaucratic impediments to entering a brand new product like ours in a new arena, as something that is on the list of things that government agencies buy. It is not that hard to fix, but

there are adjustments that need to be made and I believe it is an area where the Congress can help, and that would provide the same benefits that I talked about.

The second area in the civilian Hummer effort, and this also applies to the military Hummer, that I would mention, is the export of the Hummer. We have, of course, been selling the Hummer to other governments around the world as a military vehicle for some time with some success. That is an important part of our business base which has the same benefit that selling the Hummer as a civilian vehicle has. It broadens our base, it gives the U.S. Defense Department greater flexibility in their procurement of the vehicle in that they do not have to buy as many of them to keep the same production base. So export foreign sales of the vehicle as a military vehicle are a very important thing to us and an important benefit to the U.S. industrial base. And again, I would urge that the government aid in every way that makes sense and not impede with regulatory provisions, the export of the Hummer around the world.

One of the areas where this can sometimes be a problem is that because it is a piece of defense equipment and there are necessary and important provisions for tracking and controlling the export of military equipment, we sometimes get caught in that situation and I would simply say again, remember that we are a plow share, not a sword. And the vehicle as a vehicle does not change the balance of power in those situations and in fact provides tremendous benefits to developing countries.

As a footnote to that, and I think, Tim, this is a subject of interest of yours I know. The United States is going to be involved in providing aid around the world as it always has been, and especially today to the elements of the former Soviet Union as well as other countries around the world. In that effort, there will be—surely there must be—many opportunities for the Hummer to play a role in that effort. It offers, entirely outside the military context, because it is a remarkable truck with great cargo capacity and great mobility, and especially in the developing world but also in Eastern Europe and the former Soviet Union, tremendous capability to the recipient, and all the benefits that I have already talked about, to this country.

So again, as the United States extends its hand to help other countries around the world that need that help, where aiding that other country is very much in our own national interest, where it is appropriate, and there must be occasions for the Hummer to be part of that effort, I would urge the government to look for those occasions and facilitate them.

In the training and education area, a couple of observations. We do a great deal of training. We have—it is probably in the nature of a rather mature and sophisticated work force with relatively high paying jobs that we have, we have need for training to keep abreast of new developments. When we introduce new methods, technologies, procedures in our manufacturing processes, we find the need for training. We do that at the present time largely through mechanisms provided at the state level. We receive assistance, and valuable assistance at the state level in doing that. We just recently received a grant to assist us in training from the state of Indiana. We generally provide that training through the local

educational institutions that we referred to a couple of minutes ago, through IB Tech, through IUSB. Some of it is done in their classrooms, some of it is in our plant, It is a very important part of keeping our work force abreast of what we need to do. We largely do it now through the state. There—as Steve suggested, there are lots of pieces of that effort and the more it is possible to coordinate those and for the federal government to assist in encouraging those kinds of efforts as the state of Indiana does now, I certainly would encourage that.

A funny little footnote as an example of ways in which government with good intentions, can create problems. We have in AM General what I think is a very excellent tuition assistance program for our employees, where we help to pay for both education and training that they engage in. That tuition assistance is exempted from being taxed as income under a provision that is called Section 127 of the Targeted Job Tax Credit. But that is a temporary exemption which expires on an annual basis and is then extended by the Congress. But that is sort of—and it never happens in a very timely fashion, so the extension—it usually expires and is then extended after-the-fact. The employer has to go in and withhold the appropriate income tax after not having done it, and then when the extension comes through, go back and give it back to the employee. It is bad for the employee, it is bad for the employer. It wastes resources and takes time, and could very easily be corrected if the Congress would just simply make that exemption a permanent one. A small thing, but the kind of thing that can be fixed relatively easily and should be. It is an area where the company is trying to do just the sort of thing that everybody wants done and an unintentional government regulatory aspect gets in the way of that.

In the area—Steve touched on this—of labor/management relations, it is an evolving area and a very important one. We are perhaps relatively rare in American manufacturing industry these days in that we have a union-represented work force and we are very proud of having that relationship. We have worked very hard on, along with our United Auto Workers representatives in moving our labor/management relations into the next century and breaking the old dead patterns of confrontation and name-calling, approaching our relationship as a partnership, as a problem-solving exercise. We have made tremendous gains and we are very proud of them. We signed a new contract last year, the first time in over 20 years without a strike, without acrimony. I said that at the time, but I will point out now to everybody that over a year later, all the participants in that agreement are still very pleased with it and happy about it. We did that by approaching the challenge as a problem-solving effort, a joint effort and a partnership. We are very proud of that.

That kind of thing has been facilitated by things that have been encouraged by the federal government. The Department of Labor's Work Force 2000, the Federal Conciliation and Mediation Service encouraging the formation of local entities such as our Committee for the Advancement of Labor/Management Relations, which is here in South Bend, and part of the process that I just described of moving labor/management relations into a new plane. Those ef-

forts to create that kind of entity at the local level have been encouraged by the federal government but the federal government, having done that, sometimes goes off and waters other flowers and we find it difficult to get funding for the Committee for the Advancement of Labor/Management Relations. So I would suggest that that kind of effort is a very important one for enlarging the way in which labor and management do business. We have made some of the accomplishments we have made so far with the assistance of the government, but I would urge the government to stay involved in that process and help fund those very valuable efforts that they helped to start in the first place; they, the government and government agencies.

Steve alluded—and I will just touch on very lightly—to the situation I think everybody knows about. You read articles endlessly about the fact that the United States structure of tort law inhibits the introduction of new products. It does. That is one of those problems like health care that I am afraid I do not have a solution to, but I am here to say that the problems presented by the current situation of tort law, particularly with regard to product liability, speaking as a manufacturer, bringing a new product to the marketplace. That is not a happy situation and it presents tremendous road blocks and obstacles to any manufacturer trying to bring a new product into the marketplace.

Steve mentioned environmental concerns. You might expect that a businessman would come and say that environmental regulation was a problem and perhaps not be a major booster of the rules and regulations concerning the environment, but I am not going to do that. I think that our efforts as a society to deal with environmental problems are terribly important and we recognize that as a business and work very hard to be responsible. So I am not suggesting that there be less concern with environmental matters at all. But I would suggest that we should all watch for those situations where the regulatory implementation of worthwhile goals turns into unnecessary impediments to local business and the expansion of local business. We have had circumstances larger than our individual one here in this area, and that is an area where we can all watch for the creation of circumstances where good intentions turn into administrative impediments.

A final comment on education. I mentioned the tremendous progress that we have made in attacking all our challenges as a team, in a spirit of problem-solving, improving our ability to communicate with each other and with others and hewing to very high and demanding standards of quality and achievement and suggest that those are values that the school systems would do well to implement as part of their program, along with all the discussions about this skill or that skill. The elements of team-work, of problem-solving, of communication and of the need for and satisfaction involved in achieving setting high standards and achieving them, are very, very important core values that have definite benefits to American business and certainly to ours. And anywhere that our society can encourage and implement those values, it needs to do so.

And on that note, I will conclude.

Mr. ROEMER. Thank you very much for the comprehensive nature of the testimony as well, Craig, very good insights and we have a number of questions to ask.

Frank, I would also like to welcome you. Frank Scharpf, also with the Hummer plant in Mishawaka, Indiana, the Director of Planning, and if you did want to make—I know you have not submitted testimony, but if you wanted to add anything to either Craig or Steve's testimony at this point, you are welcome to do so. Or if you would like to wait and participate in the questions and answers—whatever your preference.

[The prepared statement of Mr. MacNab follows:]

Fact Sheet

AM General Corporation
CORPORATE COMMUNICATIONS
105 North Niles Avenue South Bend IN 46617
Facsimile 219 284 2933 Telephone 219 284 2929

August 28, 1992

SUBCOMMITTEE ON ENERGY AND SUBCOMMITTEE
ON TECHNOLOGY AND COMPETITIVENESS
FIELD HEARING

Statement by Craig C. Mac Nab
Director, Corporate Communications
AM General Corporation

AM General faces two key economic challenges:

1. As a defense contractor and manufacturer of the HUMMER, High Mobility Multipurpose Wheeled Vehicle, we must confront the potential reduction in military requirements for our products consequent to the "end of the Cold War."

2. We share with all businesses the awesome challenge of the spiraling cost of health care, which cancels out all our gains in productivity, consumes resources needed for growth and becomes a source of conflict in the work place. We cannot offer a solution to this difficult problem, but we would say most emphatically that any health care program which imposes an additional burden is not the answer.

Civilian Conversion of the HUMMER:

We believe that AM General's significant initiative to market the HUMMER as a civilian vehicle represents a leading example of the potential for conversion and redirection of the United States' defense industrial capacity. Although AM General has funded the initial engineering development to adapt the HUMMER for civilian use, the application of sophisticated automotive technology such as anti-lock brakes and built-in diagnostic capability remains to be done. This is an area where government/industry partnership in funding engineering development would be appropriate and highly beneficial.

Export of the HUMMER:

Export of the HUMMER both as a military and a civilian vehicle is an important part of our business base and very much in the national interest. Any government action which helps or does not hinder export sales contributes to our economic viability. The United States is going to be involved in providing aid to the elements of the former Soviet empire and other countries around the world. There ought to be opportunities to make the HUMMER a part of that aid. Such a course would put a valuable tool in the hands of the aid recipients while simultaneously supporting American workers and the U.S. defense industrial base.

Mr. SCHARPF. I would like to make a couple of comments of support. Certainly coming from the same organization as Craig, we kind of colluded in preparing the testimony—just a couple of comments, if I might.

Steve mentioned the activity here in South Bend allowing small businesses to try to compete for government contracts and teach them the government contracting. That is one of the things that has discriminated us from our competitors, the ability to deal with procurement regulations and those kinds of things. So it helps. But a balance has to be maintained. I think those kinds of regulations were generated in the extreme care trying to administer the public dollar. Those are the kinds of things that make those bureaucracies because it is under so much scrutiny. So in defense of the regulation to a certain degree, that is from, if you will, the civil servants desire to make sure that he does the right thing. But somewhere there has got to be a balance and I would advocate also some streamlining both for the small business as well as for the major defense contractor, if we could be put into that category.

The second item, education was mentioned and certainly the definition of what kind of education is necessary for our work force is one of the questions at issue. My personal feelings are that education is literacy, the ability to read, comprehend, analyze, articulate and communicate ideas. With that kind of a basis, then training can take place very easily. It provides flexibility, adaptability and a yearning to learn more.

We have a tuition assistance program at AM General and it is purely voluntary, we do not go around beating the bushes. And it applies both to salaried and hourly personnel, there is no distinction. The utilization of that program might be a little bit less than you might desire, but the opportunity is there. Without that basic education, the incentive to go seek more is not there. So that the basic education is literacy articulation, analyze, and problem-solving—that phrase problem-solving was used I will bet you 25 times so far this morning. And that is what they need to learn, how to address, assess and solve a problem because that is what life is all about, whether it is the workplace or at home.

A little more support for Craig, when we are talking about the Hummer as a product, able to help places like the Soviet Union. I am an old Soviet economic geographer and I strongly support the use of a vehicle like a Hummer in countries where the infrastructure virtually does not exist. One of the major economic problems in the Soviet arena is distribution. They cannot distribute product, nor can they get raw materials to the market. In the absence of a road network—and roads are expensive to build, maintain, and they take a lot of time. Vehicles that do not require hard-top, high-speed highways is a very, very or a quicker solution to that distribution problem. And a vehicle such as the Hummer I think has a major—could be a major contributor to do that; not just in the Soviet Union, but the third world and Africa. Where infrastructure does not exist, that type of product is a quick solution for relief.

And the last point I would like to comment on is about the preservation of the defense industrial base. AM General has been a defense supplier since 1940, traces its history back to the Willys Overland and the first jeeps. The elimination virtually of the cold war,

we have to look at the plow shares. As Craig says, fortunately we have something that looks like a plow share, it has just been painted a different color and do some other things to it. We really can go 100 percent away from our primary customer. We also have a—I guess you could call it a patriotic motivation, the whole, our whole company does, that that defense industrial base has to be preserved. We recognize that the force structure is going to be reduced. The industrial capacity of the United States for defense purposes will shrink, but it cannot be eliminated, and the preservation of that defense industrial base has got to be cooperative between industry and the government.

Those are my comments, sir.

Mr. ROEMER. Thank you very much. I would like to thank all three of you for your inciteful and comprehensive and well-prepared testimony. I know members of Congress will look forward to seeing it as we come back from our work periods in our districts, and I hope other members of Congress are doing these kinds of things during this couple of week period, seeking out the ideas of their constituents, looking for ways that we solve these problems working together, looking for innovative new approaches as we have mentioned here this morning.

Steve, that brings me to what I saw from your testimony as kind of a curious innovative new idea, looking at these plans that you described for the community learning centers. What kinds of ideas do you have in mind for these, what types of organizations would come together? Can you be a little bit more specific in describing these?

Mr. QUEIOR. Sure. We have had probably four or five meetings over a half a year period, bringing together a variety of players, educators and people that operate work force training programs and job placement programs, some employers, some communications and technology experts and kind of grassroots neighborhood groups, if you will, because the concept in a nutshell is that a set of computers and other learning resources and a satellite dish to access bigger data bases or interactive tutorial computer software would be put, for instance in South Bend's example, in the heart of our district, Martin Luther King Center or the Hansell Neighborhood Center or perhaps in a downtown location such as in the former Central High School.

But the location is not that important as long as it is accessible to a large number of people that have need for upgrading their learning and their knowledge and their skills. And it hopefully could be a mixed use type of facility where people of different ages and whole families might come in and in fact small businesses could utilize in the evening where they have difficulty with the expense of setting up their own training programs or their own computer labs or something like that, they could come in and just use the resources kind of piecemeal. It would be very much a situation where you would hope, like the innovative program at IVY Tech, that a parent and a child might come in together to learn computer and to learn everything that now through a CD ROM disk or off the satellite you can access through a relatively inexpensive computer. And it kind of starts to create a school without walls or a lifelong learning, cradle-to-grave learning situation across the com-

munity where once the child leaves the school at 3:00 or 4:00 in the afternoon, then they can go in the public housing project possibly and go into such a community learning center, perhaps interact with the adults and business people and employers as the shifts kind of overlap and they are doing their computer classes or accessing whatever body of knowledge on computer, 4:00, 5:00, 6:00 in the afternoon, and the business people come in with some of their workers being upgraded.

Whether or not you would actually add in across the hall human services, in terms of case working or immunization or things to help the whole progress of our human capital, that would be probably a second step or another part to the equation.

But it is really just trying to bring things, bring education and training to a more accessible, more round-the-clock, more convenient, more reinforcing type of situation and better prepare those folks.

Mr. ROEMER. Let me ask you a couple of follow-up questions to that too. I see different businesses throughout the Third District, sometimes developing schools within their business and other times participating in different ways through IB Tech or IUSB or a high school to improve education. What we are talking about here is a little bit different. Steve probably has heard me mention if not once, a dozen times my ideas for this, which I agree and concur with you on. I call them CAMERAs, because not only do we try to take a picture of the future to see where we need to go, but the CAMERA would kind of define and stand for what exactly we are trying to do. It stands for Centers to Advance Manufacturing and Education to Rebuild America. And instead of going to one side of town for a small business incubator, another side of town to the bank to see where you can get access to patient capital, another side of town to see where you can go for education and worker training, let us put these kind of services under one roof, let us combine and integrate these expertise—areas of expertise. I think that is terribly critical because sometimes an entrepreneur has a year window of opportunity to get that idea, you know, to the marketplace and if they are going around South Bend and Indianapolis and Washington, D.C. and all across different communities, I think it becomes very difficult to do that.

So I guess my question is, if you and I agree on this kind of concept, what is the role of the federal government in helping to put these together? Is it one of leading role, is it one of supporting role, is it one of throwing the idea out there and not trying to regulate it at all or participate? Where do we go from here with this kind of idea?

Mr. QUEIOR. Well I think there is a role for the federal government and the Americans have been historically such a fiercely independent, you know, I have got my idea, I will start my program and we will do it, and we have this whole landscape or smorgasbord of them that the idea of coordination—I am not at all worried that the pendulum will swing too far and will over-cooperate. In terms of encouraging kind of one-stop shopping, one-stop learning, one-stop business creation or expansion in a CAMERA center or like type of innovation, I think the federal government can disseminate information about the idea and put carrots or incentives

out for the programs within the family of efforts that would come together.

It kind of goes back to just the education and training area. I believe that a lot of the work force involvement services or PIC dollars originate as federal budget expenditures and a lot of social service dollars, be they through health or welfare and so forth, originate from decisions in Washington, D.C. And one possible model would be that you can get a larger increase or a little bit more in your project or in your area if you, in fact, go ahead and innovatively combine with a couple of other services or programs in the community. So it would be a financial benefit in terms of the allocations you make, for public welfare and work force development and the Health and Human Service immunization effort because I think there are two issues at hand, one is the consolidation and cooperation and the synergy you get by putting more things together and the other is by being more proactive and preventive rather than reactive, which is easy to explain in health care terms. We immunize all the kids and we get kids instead of just 60 percent, if we get 100 percent seeing a doctor, a pediatrician on a regular basis, that expenditure is one-tenth of the savings down the road. But I think mainly in terms of financial incentives for innovative collaborations might be the federal government's greatest chance for impact.

Mr. ROEMER. Let me begin to—and that is an excellent answer I think too, with a lot of spin-offs that we could get into for hours here.

Let me bring Frank and Craig into this as well too and start talking about ways by which your organization, the Chamber—Craig and Frank probably work with you or you work with other local businesses—

Mr. QUEIOR. Great members here.

Mr. ROEMER. —on exporting. What types of organizations or training programs do you have set up that encourage and entice or teach local businesses to export? We see that exporting is leading so much into the growth in this economy. I saw a figure recently where 80 percent of the growth in this economy is coming from exporting. It leads to a couple of questions I have for Craig and Frank too on exporting of the Hummer either in foreign military sales or in other areas as well too. Whether we talk about the Hummer being helpful in delivering food and in Somalia, whether it be in U.N. peace-keeping operations in the former Yugoslavia, whether it be in delivering disaster assistance, transportation problems in the former Soviet Union, whether it be in Louisiana or Florida right now helping out in delivery assistance.

Mr. MACNAB. Where you can be sure they are on the road as we speak in just that role.

Mr. ROEMER. Absolutely. So how do you help locally or how do you teach, let us say a local business and they come to me, we took a number of business leaders down to Indianapolis when the Koreans came in to buy Hoosier products. What do you do and how do you work with Craig and Frank and if somebody comes to us, how do we point them toward you for help in exporting.

Mr. QUEIOR. Unfortunately I can answer that fairly briefly because we do a limited number of things and wish we could do more.

One thing is we staff about an eight-county group called the Mishiana World Trade Club which is a networking opportunity for businesses that export directly and for those freight forwarders, attorneys, translators, bankers that provide the support services. So just getting those players together is somewhat of a service and we will be a liaison to the Indiana Department of Commerce that has certainly some good programs and targeted programs in the U.S. Department of Commerce. However, unfortunately we were in the past, some five years go, in the early 1980s up to the mid-1980s, able to have a trade specialist from the U.S. Department of Commerce come from Indianapolis and spend a day a month in our office. And we would through the month accumulate appointments from largely businesses that were new to the international trade and export game, but in fact if they can find their way through the new issues, would help do just exactly what you said, help the economy expand and create jobs and generally they are good paying jobs and bring new money back to America in two local communities.

And through I assume budget cuts, we have lost this service of having this expert come up and spend maybe an hour apiece with eight business people each month over the course of a year. I mean that was fantastically productive, and it is a little bit like the Department of—the Bureau of Labor/Management Cooperation in the U.S. Department of Commerce where we have, over the last five years, been able to get experts to come in and put on seminars such as win-win negotiations. It really helped some of our most key employers that help create business for other businesses and create jobs for other firms. And we realize there is a federal deficit out there, but these things were really very small targeted investments with I think large returns.

So we could use more help to expand programs for export assistance.

Mr. ROEMER. Craig, did you have a follow-up on that? I saw your head nodding.

Mr. MACNAB. That is the thing that I touched on earlier about the Department of Labor, Bureau of Cooperative Labor/Management programs and the Committee for the Advancement of Labor/Management Relations; the availability of help from those federal agencies, both in terms of people and funding, has been better in the past than it is at the moment. And that may look like a good place to cut but, as Steve I think was suggesting, the payoff is enormous I think in relation—it may be hard to see that when you are somebody doing a budget, you know, in an administrative agency. But I know, I think Steve can say in his Chamber role and certainly we could as employers, I think I said it with some feeling, our accomplishments in that area significantly aided by those mechanisms are—there is no way to put a dollar figure on simply that accomplishment of avoiding a strike last year and getting our whole labor/management relationship on a far more enlightened basis. It is an example where the government did something really good and has backed away from doing that as much. It was a good thing.

Mr. ROEMER. Well just as you mentioned in your testimony as well, Section 127, for educational benefits for employees, that is

something again that is a minimal amount of money that Congress could extend probably and we should look at ways by which we get a permanent extension of that Act. Again, there is a way of helping the business and the labor community and the educational community get our workers trained in the best manner possible without adding to the paperwork through delays when Congress can extend that in a timely manner.

Mr. MACNAB. At the risk of changing the subject, you mentioned a minute ago—talking about the role of the Hummer internationally—the fact that Hummers are in use in disaster relief in Louisiana and Florida in the hands of the National Guard. But it reminded me that we just the other day had a situation where the city of South Bend with its river rescue squad signed an agreement with the state of Indiana Emergency Management Agency to have that city resource help in emergency relief at the state level. The Federal Emergency Management Agency, FEMA does provide funding for all kinds of state and local agencies to do what they need to do in the emergency or disaster relief area.

I mentioned earlier in my testimony the way the Hummer could play a role in government agencies outside the military. That is exactly the kind of thing I was talking about.

Mr. ROEMER. Let us talk about that for a minute then, Craig, let us talk about, first of all the possibilities and second of all how government, how a Congressman and Senators can be helpful in that effort. You and I have discussed in the past how the Hummer might be helpful in the Forest Service, how it might be helpful in the Border Patrol, Immigration and Naturalization, FEMA. When I talked to Secretary of Agriculture Madigan about this almost a year, he mentioned about four departments within the Agriculture Department that would be interested in looking at the commercial uses of the Hummer.

What other government agencies domestically might we look at, what are you pursuing, how can we help in that pursuit, and then applying that internationally in foreign military sales and in international relief efforts through the United Nations, where have you made progress and where can the government help you make those initial contacts?

Mr. MACNAB. Domestically, we have probably done the most in the area of—and there is an entity called the National Wildfire Coordinating Group, that is a combination of federal, state and municipal agencies with responsibilities for wildfire control, and that is the term they use for everything from forest fires to landfill fires, I think—grass fires, brush fires, fire that is not where it is supposed to be. There is a lot of that responsibility. We hear about the big forest fires in the west but there is in every part of the country, all the way from the federal to the local government level, there are needs and responsibilities in that area and that is one where we know that when we go before the firefighters and say this vehicle of ours can become a 300-gallon pumper, 250 to 300 gallon pumper that can go where the fire is when the fire is small enough to put out instead of you having to wait at the road or the fire break to try to stop it when it gets there, which is the way they have to do it now. They get very excited.

Mr. SCHARPF. I would like to point out that the Department of Natural Resources in the state of Michigan owns one. That truck has been shipped from Michigan to Idaho and is currently employed fighting wildfires in Idaho, so it has utility.

Mr. MACNAB. There is an example in the fire-fighting area where there are agencies vertically all through at every level of government. There is also a fairly obvious application in the police and law enforcement area. We are just beginning to learn the dimensions of that. And there is an area where there is an interesting sort of gray area. Some law enforcement agencies—and this would include in a sense the Border Patrol and the drug enforcement people—have a use for the military vehicle, not just the civilian vehicle but the military vehicle as it exists or with some modifications. The Defense Department has its own safety standards and operates exempt from all the provisions of the—what is the right—Federal Motor Vehicle Safety Standards. I am always reluctant to say that because it sounds like the military does not have any, and they have their own rather elaborate safety standards which parallel but do not duplicate the Federal Motor Vehicle Safety Standards, because the requirements of the military are different. And when you see National Guard vehicles on the highway, they are exempt from those standards, they are operating under the military standards.

When other government agencies have a need for the military vehicle, they do not necessarily share in that waiver that the Defense Department enjoys. So one of the big things that we have done in making the Hummer into a civilian vehicle is bring it into compliance with the Federal Motor Vehicle Safety Standards and make the National Highway Traffic Safety people happy with the vehicle. That has been a significant effort, one that we have engaged in. But there are agencies that would like to use the military vehicle that are not military agencies. Therefore there is probably some potential for finding ways to—some of the agencies may not need that relief, others do.

The Border Patrol is included, got themselves included in the Defense Department's waiver, so they could use military vehicles. But the police and law enforcement area, not just for the military vehicle but for the civilian modifications of the vehicle is—and again, there are agencies from the federal government, I have suggested to the Border Patrol and the drug enforcement people, the drug enforcement people are using military vehicles as we speak, they get them from the military. The Border Patrol has experimented both with military vehicles and with a special adaptation and it is my understanding that they intend to buy more. That may be one of the first places that it shows up.

But there obviously is a lot of law enforcement potential, again, all the way down to the local level. And the opportunity I think for Congress and the federal government is—and one of the reasons I mentioned the FEMA thing, there is an instance where there are federal agencies that could use the vehicle and the help there is in getting it on the list of things that they can use. You know, this simple sort of administrative—the GSA register—because when federal agencies buy stuff, they have to go to approved sources. We are an approved source for the military, it is a matter of making us

an approved source for the other agencies. That is really a very simple thing and yet in bureaucratic terms it may not be as simple as it sounds like it should be.

But the other piece of that is that through agencies like FEMA, there is federal funding for the provision of equipment for other levels of government. And here we have a piece of equipment with great appeal to other levels of government who then immediately face the problem of being able to afford it. And there is grant money I know of FEMA, there may be other places. You have explored that more than I have. And that is the kind of thing that—I am suggesting some that we know about, I know that you know about some, and do not stop looking for places.

Mr. ROEMER. Let us talk about one where we know there are available funds right away, in the defense bill that we recently passed, defense conversion money is available for precisely those companies that are making the conversion from producing swords to producing plow shares and doing exactly what you are already doing. Again, what role are you playing in trying to get these funds? Are you eligible for some of these funds? How can we be helpful in future defense bills? And this is not just a specific question for you, it is a specific question to Frank and to many other businesses located in the state of Indiana that are currently in the defense industry that need help in making this conversion. We do not want to put workers out on the streets when we make this conversion. We also included in a military bill, for instance $250 million to help military personnel interested in making the jump from the military to teaching or academic profession. Frank, you touched on where we need to go in academics to ensure better problem-solving ability and thinking skills on the job.

Where do we go in this defense conversion process, where are you at in this and what recommendations do you make in future bills in terms of defining the language so you get access to these funds that we have appropriated?

Mr. MACNAB. I will let Frank give the principal answer to that because he has been involved in our efforts in that area more directly, but would offer by way of preamble that—and it was one of the reasons for my plow share remark—that a lot of the thinking connected with defense conversion is people who made jet fighters need to make washing machines and that in doing that worthwhile effort we not overlook the fact that we already make plow shares and yet there are still things that we need to do where the government can enter into a partnership with us to facilitate carrying that product into those other areas, but that we not overlook our effort because it is not stopping making A and starting to make B.

Mr. ROEMER. Right.

Mr. MACNAB. With that by way of preamble, I will let Frank—

Mr. SCHARPF. I would like to use the example that Craig mentioned earlier, automatic braking systems which are becoming very popular, being applied to virtually all commercial automobiles. Although we have built quite a few Hummers, we are a low-volume producer. The vehicle is also called a non-developmental item. We were charged with using maximum use of commercial components to build this unique vehicle, which we did. So we have a General Motors engine, we have a hydromatic transmission, those kinds of

things. In some cases they had to be modified for a unique military requirement; i.e., make the starter waterproof. Your car does not have a waterproof starter.

Mr. ROEMER. I know that.

Mr. SCHARPF. Or windshield wiper motor, those kinds of things. So we had to induce the manufacturer, the original equipment manufacturer to do that for us. We did not pay him to go out and waterproof his starter. We compete those folks, we go to Prestolite, we go to any electrical manufacturer and say we are looking for a starter that does these things. If you want to play, come up with one and we will put you on the truck. So they do it out of their pocket.

Automatic braking systems, we have to go to a brake company; whether you go to Bendix or TRW or someone like that, and to put on automatic braking systems on a Hummer, we cannot get anybody interested. We do not have the dollars to do that. The government would like to see, the Tank Automotive Command, our primary procurement agency for tactical trucks, wants to see automatic braking systems and we have worked with them and talked with an OEM and he said no, I am not interested. I do not want to put the resources because the long term volume manufacturing, I will not recoup my investment. That is a prime example where there is dual use technology conversion that could help. Money specifically identified for that technology application for that vehicle, then we can make it happen. So that is part of that conversion process.

We also know that, for example, our engine manufacturer is moving the engine production to Mexico. Procurement rules say we have to have the engine in North America. North America means Canada and the U.S. I do not know what the impacts will be of the North American Free Trade Act, but those things are all phased. I have a much more immediate problem and I am going to have to—by 1995, because our current engine is emission compliant through 1994—I have got to come up with a new engine for that product. Those kinds of things will help or are opportunities for help with that conversion money.

Mr. ROEMER. I would like to follow up with you more on that question. We need to get in a couple more and then make the segue here to the next panel shortly as well too. Let me begin to make the segue into the next panel by bringing up a question that maybe all three of you can make a brief, hopefully succinct, comment on. And that is health care.

What ideas do you have for working together, government and business and labor, all three working together to come up with innovative ideas to contain costs, to improve access, to help make us competitive with other countries. I saw in the paper yesterday that we now make a car more efficiently and more productively than the Japanese and the Germans; however, when you add in health care costs, we are significantly above them. So this is something that is hurting our international competitiveness, it is something that I believe we need to look at ways by which we all work together and I am very anxious, although Craig admitted that he does not have the panacea, maybe you have some ways by which we can look for solutions to this, so that—as Steve mentioned, preventive

care is one very important thing. Please let me open it up to the panel. Grab the microphone, Steve, so we can get this recorded.

Mr. QUEIOR. Hugely important topic obviously for the quality of life in our society and for the competitiveness of employers and for the quality of life of employees. Very interesting labor/management issue because both managers and organized labor or unorganized labor, everyone is concerned about their health care for themselves and their family members. I would suggest that there are two levels of activity in this. One is somewhat reactive and short term, yet needs to be taken on. And the group we have mentioned once or twice, the Committee for the Advancement of Labor/Management Relations, for instance, is holding a two-day workshop in South Bend in three weeks for union and management people to learn together some techniques that can be applied immediately for cost-containment and to learn the driving forces and issues so that they can become educated and deal with the issue as factually as opposed to just emotionally as possible.

However, we have had meetings for approximately six months. We had a Health Care Coalition in Mishiana in the 1980s and that went dormant for the last 1990-1991 period. And for six months we have been meeting again, and very quickly, the group said we need to expand, we need to involve governmental representatives such as Dr. George Plain, Health Care Officer, insurance, employers, doctors, health care providers in the sense of hospitals and it will probably get broader and broader. We look at models of health care efforts that start just with business, then business and hospitals, then evolve and get more gradually into the whole community. And I think the direction that this will go in St. Joseph County is that it is a tremendously broad effort that relates to the Health Community 2000 goals, the 65 measurable goals which again are productive because we can have base line, show progress, see a return on our investments where you are not going to perhaps hit all 65 of them, but what are the most important in your community, and compare our programs to meet those goals with other communities and learn from them as they track towards the Health Community 2000 goals.

But what we see is a tremendously broad-based coalition that will really work more and more towards education, prevention and life-style change and the things of immunization, regular primary physician care, diet, exercise and wearing of helmets and seat belts and there is a cut across the number of things that are really kind of individual grassroots things so you have to reach out in the community. You just do not convince five people on a hospital board of a different policy and in fact it will be that broad-based reaching out to the grassroots, preventive process I think that really starts to lower this tremendous pressure on health care increases. The unfortunate side is it may take three, five, seven—some things, seat belts and helmets, you start saving $100,000 an accident tomorrow. But some of the other things with primary physician care and accessibility and education and life-style changes and so on, may be three, five, seven years but huge payback. To effect those it seems like it really takes the broad-based network that I think more and more communities will try to build. Any information about what is going on, and we have established a list of 48 of

these going on around the country already, but the government being a sort of convener of how people are wrestling this complicated thing to the ground on a local level would be fantastic.

Mr. ROEMER. Craig, I know you can talk from personal experience, you were part of a health care town meeting we had back earlier in the year. Maybe you can talk specifically about what you have been able to do and lead into what you opened up with in your testimony. How the union and management have worked together to solve some of these problems.

Mr. MACNAB. We recognize that we are a part of the larger health care picture. One of the concerns nationally, the kind of thing that you have to confront is people who have no health care provision, are not employed or are employed by an employer that does not provide it. We are a different part of the forest, we are the part of the problem where we are a company that provides very good health care benefits for its well-paid employees. But where if you take the increase in our health care costs and straight-line them into the future, we are out of business.

Mr. ROEMER. Where are you on that, what percentage or where are your costs in health care right now?

Mr. MACNAB. I have not got the numbers at my fingertips to be able to do that.

Mr. ROEMER. Could you provide that to the committee?

Mr. MACNAB. I think we could, certainly. I would be delighted to do that.

Mr. ROEMER. Okay.

Mr. MACNAB. So the first approach that we have taken, the sort of immediate one, and we participated, tried to, in the sort of thing that Steve has talked about, in bringing this problem—it is not our problem alone, it is reproduced throughout other businesses and other elements of the community and one of the ways to tackle it is as a community. I might have said earlier, and this is not because Steve put that $20.00 bill in my pocket—by way of beating the Chamber of Commerce's drum, we participate, we try to, in every level of the Chamber's activities and the Chamber in this community—one of the wonderful things about this community is that it is a community and the Chamber is one of the things that creates a forum where many of the important issues that the community has to face as a community are dealt with, and is absolutely invaluable in that way.

Mr. QUEIOR. Gary Washlich of your corporation is a key member of these health care discussions.

Mr. MACNAB. And the guy who has those numbers at his fingertips, who could not be here with us this morning, but who taught Frank and I all we know on the subject.

One of the first things that we did was approach the management of those costs, trying to track them and get a handle on them because what we knew was that our bill kept going up, but not why. And so one of the first pieces—it is what a business manager does with any situation like that is say the phone bill keeps getting bigger, who is making the calls. And breaking down our bill so that we know who is making the calls. Where are those costs spiraling, is it everywhere or in certain areas. And if we can identify what areas, short-term drug treatment rehabilitation programs are hid-

eously expensive and repetitive. That is one of the things that I think we found in doing that survey.

You can then address the problem in a more detailed way if you know what the aspects of it are. So that was one of the first things that we did. That is short-term but I think that has provided some real benefits and savings for us, in simply recognizing what the problem was that we had to deal with and being able to identify it, and carrying that forward into the labor/management area.

I think one of the important gains that we made was a tendency—this is not something unique to organized labor, it is one of the ways that all of us have a tendency to look at things that—services that are provided by the government, is that they come from somewhere. It is yeah, I pay taxes and I have these services I get from the government, but the direct connection is not very clear. Services that I get from the government just come from some sort of nameless place in the sky.

Employees like ours, and I do not mean just the union people, but employees of any employer who provides health care, know—they have got a job, they expect to get health care, they want the employer to pay for it, but the fact that that amounts to X amount of money that comes from somewhere, that is money that otherwise could be in my paycheck or be doing some other worthwhile goal—the connection was not always very clear. But I think we have made tremendous strides in having our work force recognize—and it was partly because we could say look, this is—you know, we say the health care costs keep going up, well they go up because of this and this and this and we are all part of that. You know, 30 percent of that is me. Oh—it starts to become real and I think we have made tremendous strides in having our employees recognize and agree to participate in helping to manage those costs, not simply "I want health care and I want you to pay for it, I do not care", but that that has to be managed, it has to be rational, we cannot put the company out of business trying to pay for health care. So if in fact the cost for this kind of care are exorbitant and rapidly escalating, then the work force has to join with us. We can go to the provider and try to find out why it costs so much and is there not a way to do it cheaper. The work force can say we have go to stop making so many calls on that extension. And we have made I think tremendous progress. It is going to take awhile for that to really pay off.

There is another important part of it and Steve alluded to it, and that is the whole cultural life-style change. We do not smoke in any of our installation in the workplace any more. That is not quite the same as saying that nobody who works for the company smokes, but the company is no longer a friendly environment for smoking in the workplace and it is not going to pay off immediately in a measurable way but it is a very important long-term step.

By the same token, we have tried to address all the cultural aspects where consciously or unconsciously we might have been encouraging or seeming to accept the use of alcohol. We do not do that any more. And we certainly have never encouraged the use of drugs. But those kinds of—we are trying to take steps to encourage people to exercise and to eat properly and all those kinds of life-

style things which in the long haul, there are two pieces to the problem.

One is why does it cost so much in terms of delivering the health care and is there a way to make that cheaper, at least our part of confronting the problem. And the other thing is why do we have the health problems that cause the costs. What can we do on the supply end. That is the way we are tackling those things.

I do not pretend to suggest that we are okay, we have got it fixed.

Mr. ROEMER. Right.

Mr. MACNAB. I started by saying that what we are dealing with is not the whole problem. There is another whole universe of people who are not under this tent, and I know that and I know that has to be dealt with. But in our tent, that is the way we are trying to patch the holes.

Mr. ROEMER. Frank, did you have anything to add?

Mr. SCHARPF. One comment that is not peculiar to the items that Craig was addressing but it has always occurred to me that as in any science or whatever, always trying to advance the state-of-the-art. I think that in medicine that is also true, both in terms of techniques, machinery, tests, medicine, you name it, we are improving it, there is more available. We can do more. And because we can do more, we tend to do more. And all those new things do not come cheap. They are all in addition to, they do not eliminate something else. So that just the basic doctor's visit, to some degree, you have got five or six wickets you go through whereas you used to only go through two. On the other side, that is encouraged to some degree because, as Craig mentioned, the-we call it product liability, the doctor calls it malpractice, but they are the same thing. He has got that threat or a tremendous insurance premium, as I understand it, only from what I have read, I have not seen any of those bills, that he has to pay. To keep his premiums down, he tried to minimize the occasions in which he might be taken to task. To do that he exercises all those tests in screening. So we have that on the technology side that is—

Mr. ROEMER. Defensive practicing.

Mr. SCHARPF. That is correct.

Mr. ROEMER. In Indiana we do have a cap from the state on what damages can be incurred, so maybe that is something nationally that needs to be looked at.

Mr. SCHARPF. That would help.

Mr. ROEMER. Well let me thank all three of you for your time and your expertise and your knowledge, and also encourage you—we have opened up some very, very good discussions here. I have not even approached half my questions for all three of you, so we have to get back and revisit some of these questions and answers on worker training programs. I wanted to ask you, Frank, a couple more questions about ideas for quality education and problem solving and computing skills. I wanted to talk a little bit about how the Baldridge award might be applied more and more to universities and academic institutions that have a direct connection to businesses in helping businesses develop new products. These are things that will have to be left for another meeting between us or another hearing, but I think that is the great thing about these

hearings, is that the open door stays open and that we keep communications very clear.

So I want to thank all three of you for your time and bring the next panelist forward. Thanks a lot.

[Pause.]

Mr. ROEMER. Let me continue the Science, Space and Technology Committee hearing with our second panel; Mr. Dave Perkins with the International Association of Machinists. And let me say Dave, welcome to have you here. I do not call myself a health care expert although I run into people all the time, many workers, that feel like they do not have, you know, as good access to health care as they would like to get. I hear stories all the time, Dave, you do too, from people that work with you and for you that they are very worried about the tentative nature of their health care benefits and erosion of benefits or existing or pre-existing conditions or the cost and the access to this.

I ran into a woman in Mishawaka the other day that said that she had recently lost a high-paying job and moved to a lower paying job without health care benefits and she was worried sick about what she was going to do, not just for herself but for her children. That is something that I think all of America is very worried about these days and your testimony and help and your answer to our questions I think can help us solve some of these problems. I know you do not have a medical degree, but as much as you work in this area, you are expert in this area and we welcome your insights and your testimony.

Also for the record, I just want to say too, feel free to do whatever you are comfortable with, either read from your testimony or I will request unanimous consent that all of your testimony appear in the record as if read and you then can go off into other areas and feel comfortable to talk about specific stories about your workers as well too—whatever you feel comfortable with, we are happy to accommodate.

With that, I welcome you and introduce you and please start your remarks.

STATEMENT OF DAVE PERKINS, BUSINESS REPRESENTATIVE INTERNATIONAL ASSOCIATION OF MACHINISTS AND AEROSPACE WORKERS

Mr. PERKINS. Thank you, Congressman. I will read my prepared statement and ad lib as I need to.

I have had a lot of opportunity to deal with the health care issue in my negotiations and I have had the opportunity to give numerous speeches on the subject. I have tried to condense an hour down to five minutes, so it is going to be tough.

I thank you for allowing me to speak to your Subcommittee today on the issues of competitiveness of the U.S. industry. As Business Representative for the Machinists Union, I am charged with the duties of negotiating collective bargaining agreements with 14 area employers. To date, I have negotiated and successfully settled 35 such agreements. While some of the membership I represent are in high-tech jobs, most are employed in typical labor-intensive manufacturing positions.

For companies to remain competitive and profitable is a high priority for us because from that stems employment and a higher standard of living hopefully for our membership through pay raises, regardless of whether the jobs are high-tech or low-tech.

In this vein, I feel that the number one issue facing employers and workers of all industries is the skyrocketing cost of health care in the country.

In absolutely every one of the negotiations I have participated in, health insurance costs have been the overriding issue, typically consuming well over half of the negotiating sessions. To give you an example of the problem, in 1986, the average cost of a health insurance policy for a family, per employee, was approximately $150.00 a month for a family policy. Today that same policy would easily cost $325.00 a month. That is a large, large increase in a matter of six or seven years.

Certainly that has been a big issue to the union as well because as those costs eat up the company profits, it affects the pay raises that we are able to get. So we have taken some initiatives and utilized many cost-containment provisions that most of you have heard of such as second opinions, pre-admission/pre-certification review, concurrent review and increased use of out-patient facilities. However, it seems that despite these attempts to control costs, premiums are continuing to rise very rapidly. It is not unusual at all to see 15-20 percent per year increase. And of course the larger the monthly amount gets, the more that is, we are talking maybe $60.00-$70.00 per employee a month more.

It is my belief there are several reasons why these cost-containment measures have not worked, and I will outline just several reasons.

The first reason is what I like to refer to as shifting of dollars. As an example, five or six years ago, insurance companies started offering out-patient surgeries at 100 percent coverage rather than the typical 80 percent, to encourage the use of out-patient facilities rather than more costly in-patient. What we have seen then was that the hospitals had a lot of empty beds and needed to expand their out-patient facilities. They did that, and to make up the budget differences, they just increased the cost of their out-patient treatment. And in fact, I have seen cases where out-patient is more expensive than in-patient now. So the insurance companies said no more 100 percent coverage, we are going to go back to 80/20. That is just one example of shifting of dollars. It just seems to me like it is an endless circle. I use an example, one year the hospitals make out, the next year the doctors make out and the next year the insurance company makes out, but for some reason the employee and the employer are always getting the bottom of the stick.

The second reason, and probably the largest, is the issue of the uninsured and the under-insured. I believe everybody is of agreement there is at least 37 million people in this country with no insurance, not to say anything of the ones that do not have enough insurance. Certainly a great burden is placed on the rest of us through taxes, through those that have health insurance and community hospital emergency rooms. They see all the people that have not got insurance. Elkhart General Hospital is a community hospital, they are telling us that more and more they are getting

people into the emergency rooms who have no insurance that need to get treated for a cold or something very minor.

Let us face it, those employers and employees who are paying health insurance costs, or paying their doctors and hospitals are subsidizing those who do not have any insurance. I have heard it said that if we go to some kind of a national health care system, that it is going to cost so much more. I do not see how that is possible. We are paying for them today. The hospital is not going to take a hit for two million dollars, they are just going to raise the cost of the hospital care for the next year to make up that difference. We are paying for it now. And the lack of preventative care that is out there for the people that are uninsured. If they were able to go and get early detection of cancer and such, maybe we would never get them into that catastrophic illness.

This health care crisis has to be resolved soon, as the crisis grows larger each and every day. Out of the 14 employers I deal with, 13 now charge employees a portion of the cost of health insurance. These range, in my own example, from $10.00 a month to $43.00 a week for a family policy, $43.00 a week is a big hit.

Mr. ROEMER. Chunk of money.

Mr. PERKINS. That is over a dollar an hour that the employees pay. I personally know of other employers who are charging even more than that, $50.00 is not out of range of a lot of them any more. These costs by the employees have certainly decreased their standard of living and has reduced their disposal income and any savings they probably ever had, and worst of all it is adding to the number of uninsured people because people say "$50.00 a week? Forget it, I will do without it." Just to make ends meet, they just cannot afford the $50.00.

Let me go off my prepared text now and give you several other examples. The two things that I am seeing more and more of, all insurance policies I have ever seen talk about reasonable and customary charges from the providers. In the last couple of years insurance companies are more and more utilizing that tactic on insurance. What they do is, you know, if you go to the doctor and have some surgery done or whatever, they will say that the doctor charged you too much, and they always tell you that after-the-fact of course so you are stuck with this bill no matter what. And they will only pay maybe $400.00 of the $500.00 that the doctor charged you. There are no—there is no criteria that I know of to say what is reasonable and customary. Some insurance companies use what they call a 90th percentile, some use 80 percent, some use 70 percent. There is no set formula at all. And of course, the insurance companies will not give up any of this information of what is reasonable and customary to the providers for fear that the ones that are not charging as much as they could would move up. So the employee is stuck right in the middle.

A specific example that I researched, the insurance company was using figures for what would be reasonable and customary that were nearly two years old. They review them yearly. So of course they are using them from the year before, so actually what they are using is two-year old charges. And I mean they get so nit-picky, ten or twenty dollars, they just will not pay it. And that is an effect on the employees.

Another thing that I am just recently seeing that very much alarms me. Many insurance policies use the term "medically necessary". I know of a person who went to the doctor and the doctor ordered numerous tests, he did not know what was wrong with her and come to find out she had some heart problems. The tests that were done that were not related to the heart problem were absolutely refused to be paid because the insurance company said well being that it is your heart, these other tests were not medically necessary.

So the employees are stuck right in the middle, I am here to tell you, and it is devastating to them. It is bad enough that they are having to pay $40.00-$50.00 a week for insurance but then you have your deductibles that are increasing on top of that and then you get stuck in the "reasonable and customary" mess. It is costing the average worker a lot of money.

If you as Congressmen really want to make our industries competitive in the world market, then please make health reform the number one priority. Keep in mind that the U.S. and South Africa are the only industrialized nations that do not ensure universal access to health care.

It is my belief that any reform must be comprehensive, and not piecemeal. I have the same fear that the gentlemen from AM General spoke of earlier, that if we go piecemeal, all it is going to do is cost the companies and of course us more money. We need a very comprehensive reform. And I believe that it must come from a meeting of the minds of employers, labor, health care providers, consumer groups and insurers, and all with one goal and one goal only, and that is providing universal access to quality health care at the lowest possible cost. It is my feeling that such health care reform must include some of the following provisions:

(1) We must eliminate multi-payers. I have read many articles on this subject. There are approximately 1500 insurance companies in the United States. The average hospital in the U.S. has to employ 50 people in the billing department to handle that load. The average doctor's office has to employ 10 people to handle the billing. None of those billing people help anybody get well. I am for a single payer or at least a limited number of payers. And on top of that, not only do you have 1500 insurance companies, you have a multitude of different kinds of policies, you know, different deductibles—80/20 or 70/30 or—it is a mess. So we must do something about the multi-payer problem.

(2) We have to control provider costs. Somewhere we have to—whether they regulate themselves, which I have no problem with, but we have to regulate the provider cost from the hospitals, from the doctors, from the pharmaceutical companies, you name it. I just went to the doctor not too long ago and by the time I got done at the doctor's office and two prescriptions, it was $100.00. Fortunately I had the $100.00, many people out there do not and would not go to the doctor just because of that.

(3) We have to have controls on duplication of technology. I just read in the ELKHART TRUTH here recently that the Elkhart General Hospital is expanding to the tune of $27.5 million. They feel that they need their own MRI machine. They had a portable one that came around every couple of days, evidently that was not

good enough and now they need one of their own even though you can go to South Bend and get one or certainly within 20 miles of this area and have an MRI, but they feel that they need one. And I am sure that is typical, it is not just Elkhart General, it is all the hospitals, they feel they need the latest technology. Why can there not be cooperation among these hospitals to use technology that way? Maybe it is antitrust laws, I do not know what the problem is.

Mr. ROEMER. It is. We will talk about that, yes.

Mr. PERKINS. It is a complete disaster though.

Another thing Elkhart General needs to do is expand their emergency room because they had 30,000 people there last year. I am going to guess that the biggest share of those people were people that did not have insurance and had nowhere else to turn. But that $27.5 million is not going to help one soul. It is my opinion, they would be better off to just hand out twenty bucks and say go to your doctor. It is incredible, but we need controls.

(4) I believe that we need to encourage preventative treatment, to go to the doctor early, to not wait. We certainly do need life-style changes. As a smoker, I am here to tell you that smoking is not good for you. It is a very hard habit to break, believe me, but life-style changes do not come overnight. I read in the paper recently that you had an idea that maybe smokers and drinkers should pay an increased premium. I have another idea, how about the government quit subsidizing the tobacco farmers. That is ridiculous.

(5) We need—whatever plan we come up with, we need to allow freedom of choice of provider. Insurance companies now control who your providers are to a great extent, but I believe at least some freedom of choice, do not limit us to one or two doctors.

(6) Have universal access, that everybody has health coverage.

(7) That this insurance be affordable, not only from an employer's standpoint. Like I said before, the employers and people who have insurance now are paying for all these people out there that do not have health insurance. Make the companies pay their fair share, but make all of them pay their fair share. Affordability from the part of the worker. I am afraid that many people would not be able to afford much of anything. I know the Canadian system allows free care, that is nice. I do not know whether we are going to be able to do it in this country, but even if you would say $5.00 a visit like some of the HMOs in the area. Pay that way, do not put it in an income tax, make the companies pay their fair share, each and every one of them. And I am sure that that share would go down for the employers that are currently paying, and then make us pay a service for use. That may take care of the problem of people over-utilizing. If they had to pay a stipend to use it, maybe they would not go in there just for every sniffle.

I guess that will be the end of my remarks for right now. This is a subject that is near and dear to my heart because like I said, I deal with it each and every day and the companies and I talk about it frequently. And I think more and more of management is coming to the understanding that the only way that we will ever get real control of health insurance is that it be completely managed. We cannot just take this area and try to do it, it just will not work. It has got to be a whole nationwide deal, we need to be able

to set budgets, set provider fees. It is a mess, but we have to do something right away.

[The prepared statement of Mr. Perkins follows:]

Presentation to the U.S. House of Representatives Education Labor Committee
Elkhart Area Career Center
August 28, 1992

Topic: What U.S. Industry needs to effectively compete in High-Technology markets

Presentation by: Dave Perkins
Business Representative
International Association of Machinists
and Aerospace Workers
District 103
1023 Fremont St.
Elkhart

As Business Representative for the Machinists Union, I am charged with the duties of negotiating collective bargaining agreements with fourteen area employers. To date, I have negotiated and successfully settled thirty-five agreements. While some of the membership I represent are in "High-Tech" jobs, most are employed in typical labor-intensive manufacturing positions.

Remaining competitive and profitable are a high priority for us, because from this stems employment and a higher standard of living for our members, regardless of whether the jobs are "high-tech" or "low-tech".

In this vein, I believe that the number one issue facing employers and workers of all industries is the skyrocketing costs of health care in this country.

In every one of the negotiations I have participated in, health insurance costs have been the overriding issue, typically consuming over half of the negotiating sessions. As an example of the problem, in 1986 the average cost of a family health insurance policy among the employers I deal with was approximately $150.00/month. Today that same policy would cost approximately $325.00 + month.

To control these costs we have utilized many so-called "cost containment"

BEST COPY AVAILABLE

provisions such as: second opinions, preadmission/precertification, concurrent review, and increased use of out-patient facilities. However, despite these attempts to control costs, premiums continue to rise rapidly.

It is my belief there are several reasons why these "cost containment" measures have not worked and I will outline several reasons:

(1) Shifting of dollars - In the recent past, insurance carriers started to offer increased coverage for out-patient procedures to encourage their use. This created a loss of revenue for hospitals as the number of empty beds increased. They in turn enlarged their out-patient facilities and made them more physically attractive for the patients, and gradually increased the cost of such procedures to the point that little or no savings from in-patient procedures existed. Because of this, today many insurance carriers have eliminated increased coverage for out-patient services.

(2) The uninsured/underinsured - with approximately 37 million people in the U.S. in this category, a great burden is placed on the rest of us through: taxes, those that have health insurance, and community hospital emergency rooms, to name a few.

Let's face it, those employers and employees who pay health insurance costs are subsidizing those that don't through higher costs of provider fees due to uncollectibles and lack of preventive care.

This health care crisis must be resolved soon, as the crisis grows larger every day. Out of the fourteen employers I deal with, thirteen now charge employees a portion of the cost of health insurance, ranging anywhere from $10.00/month to a staggering $43.00/week for a family policy. I personally know of

BEST COPY AVAILABLE

other employers who charge employees even more. These costs by employees have decreased their standard of living, reduced disposable income and savings, and worst of all are adding to the number of uninsured as employees drop their health insurance coverage to "make ends meet".

If you as Congressmen really want to make our industries competitive in the world market, then PLEASE make health reform the number one priority. Keep in mind that the U.S. and South Africa are the only industrialized countries that do not ensure universal access to health care for their citizens.

Any reform must be comprehensive and not piecemeal, it must come from a meeting of the minds of employers, labor, health care providers, consumer groups and insurers with but one goal: Providing universal access to quality health care at the lowest possible cost.

BEST COPY AVAILABLE

Mr. ROEMER. Well let me thank you, Dave, for your excellent testimony and testimony that I can tell from working directly in negotiations and with people that do not feel like they have access to this current health care system, you provide both good insight and also some interesting ideas for where we need to look. Let me comment on a couple of them and ask you some more questions.

In your prepared testimony, you talked about costs going up from $150.00 a month for a family health insurance policy to approximately $325.00 a month. You talked about a shift going on from 13 companies now that you used to deal with, out of the 14, 13 of them now require employees to make some type of a contribution.

Mr. PERKINS. Right, and quite frankly that is so we can get a raise of some kind.

Mr. ROEMER. So health care costs are going up and up.

Mr. PERKINS. Yes.

Mr. ROEMER. I think we have seen figures too that they are going up sometimes between two and three times the rate of inflation.

Mr. PERKINS. At least.

Mr. ROEMER. We spend $817 billion a year on health care. You were sitting in the audience when I talked about how it is affecting our international competitiveness. We have got the greatest workers in the world, we make more productive cars than the Japanese. We can make a car more productive than the Japanese and the Germans can; however, health care costs are making it more and more difficult for us to sell that car competitively because we are paying three times what the Japanese and the Germans are in terms of health care costs.

Mr. PERKINS. Absolutely.

Mr. ROEMER. I think GM estimated yesterday that it was $900.00 per worker per car and the Japanese and the Germans spend somewhere between $285.00 and $320.00 per car per worker. So there are significant differences here.

Last, so I can get off my soapbox too, you mentioned 37 million Americans—11 million of those Americans are children, children that do not have good affordable access to health care. So we need to transform and change this system.

You have come up with some good ideas. Before we even look at the good ideas and talk about those, you talked about these increases. To the best of your knowledge in your area, are these increases across the board, are they specific in some areas? Where are the workers and the employees and employers that you deal with, where do we see these costs incurring in what areas more than others? Do you have any general ideas?

Mr. PERKINS. I really believe they are across the board. We do have some increase in the drug treatment and those kinds of things, but I have not seen a lot of that really—some but not a great deal. It just seems across the board. Everybody's provider costs are increasing drastically. I would say the minimum increase that I see on a yearly basis is 15 percent, which would be—if inflation is running three percent this year, that is five times inflation. No matter what we do, we do not have any control over the cost of the providers.

Mr. ROEMER. So you feel pretty comfortable in extending regulations into a number of areas, whether that would be regulations of insurance companies—would you support, for instance some people are talking about regulations of pharmaceuticals to try to control costs of providing pharmaceuticals to government programs, especially Medicare and Medicaid programs. Is that something that you personally or your union would advocate?

Mr. PERKINS. Definitely. Like I said, we have to get control of those fees that right now we have no control of. You know, they need to understand that a normal company has to live within their budgets and I do not believe they understand it, whether they are doctors or pharmaceutical companies, that they have a budget, they can just raise it at will.

Mr. ROEMER. You mentioned too with hospitals, one of the problems we see with hospitals is that costs keep on going up and up and up because hospitals are competing rather than cooperating. I grew up, born and raised in South Bend, as you know, Dave, and we have two or three or four hospitals in the South Bend/Mishawaka region and in South Bend where I was born and raised, as a kid, I went to one hospital, St. Joe, for one particular ailment and then if you had something else it was over to Memorial. One of the things that we see advocated out there as a possible answer is taking antitrust legislation off the books so that hospitals are allowed through the legal system to meet, sit down and say what are you going to do on emerging technologies, are you going to get an MRI, are you going to look at the CAT scanner, what things are you going to pursue in the next 10 or 15 years, to make long-term decisions for them. What kind of out-patient facilities are you going to look at. I advocate that we do take antitrust legislation off the books to allow these hospitals to work more cooperatively and compete less. The costs are passed on to the consumer in every one of these instances and health care costs go up for you and me and for taxpayers. And I have heard even from the hospital administrators that this would be something that would be helpful to them.

Do you know of other areas, either by taking, you know, legislation off the books, instances of—you talked about—let me open it up a little bit more to you, you talked about individual responsibility, making people more responsible for their care and their lifestyles and working habits and so forth. What are some ways by which you see, you know, us working together to try to get some controls on costs? Do you have some ideas in any of those areas?

Mr. PERKINS. Well I would agree with you definitely on the hospitals and the sharing of technologies. You know, competition is a good thing in most industries because it lowers the price, but in the health care industry, competition means getting the modern equipment which raises costs. As I said before, life-style changes are important but it is just so slow. Certainly we need more education in those kind of areas but I just do not see that as being a large factor in the near future. It is going to be time consuming. I think, you know, like on the smoking issue, I think we are doing a pretty good job with our younger children to discourage smoking and that is excellent. I really cannot answer more than that.

Mr. ROEMER. Okay. Let me ask you another question. You commented too in your remarks, both in your prepared testimony and

talking in an ad lib fashion as well too about your concern for workers that do not have access to health care and workers that employers do not pay any of their health care. Do you have any idea of the percentage in Elkhart County or in the Third District of Indiana of those employers that do not provide health care to their workers? I am not talking about, you know, sharing costs, I am talking about not providing any kind of health care to them.

Mr. PERKINS. I do not know if I can come up with a percentage, Tim, but I can give you my own personal example.

Mr. ROEMER. Okay.

Mr. PERKINS. When I was younger, I went through jobs maybe once a year until I got a good union job and I worked at about seven different employers and none of them had insurance. So seven out of eight did not have any. There are many, many employers out there that do not have health insurance and there are going to be more, there are absolutely going to be more as the cost of insurance gets higher. They are just going to quit offering it.

Mr. ROEMER. One of the things that I am concerned about too, Dave, is that we have seen the instance in Elkhart of Whitehall moving away from the community, losing 800 jobs that pay people $14.00 and $15.00 an hour and provide health care benefits to many of these employees. Those are employees that help our restaurants, that help our hospitals, that help our financial services. We cannot afford, you know, to lose those high paying jobs to keep our economy going and keep our families together. The alcoholism rate, the suicide rate within those workers has increased significantly.

Mr. PERKINS. Right.

Mr. ROEMER. We are working on legislation not just for health care but on 936 legislation to shed a little sunlight on extending 936 benefits to companies so we cannot shift jobs from one community to another.

Mr. PERKINS. Right.

Mr. ROEMER. In terms of health care, some of these people are now working for companies, getting paid $4.00 and $5.00 an hour and you know, they do not have access to those health care benefits. So again, I think those are some of the things that you referred to in your prepared text as well too that is helpful for us as we search for some of these solutions for providing better access to health care for all people in our community as well too.

I would thank you for your testimony, tell you to please keep in touch with us as you run into more ideas for solving health care problems. You gave us seven that we will carefully assess and evaluate and look at. And I want to say too that we invited a couple of other people to testify specifically on health care and at the last minute one person was called out of town to look at some new business prospects in Ohio, the the UAW, Tom Ladd, I think is going to provide some written testimony as well too. He got called away and could not show up. So we did not want to have you out here by yourself talking about such a complicated topic, and we appreciate you coming down and doing that.

Mr. PERKINS. Thank you for inviting me and I would be more than happy to speak any time on that subject. Like I said, it is near and dear and it is the number one concern to us.

Mr. ROEMER. Thank you very much, nice job.

I would like to continue the hearing of the Science, Space and Technology Committee by welcoming Dr. Tomal and Dr. Hyder from respectively Purdue University and the University of Notre Dame.

One of the reasons that we thought this panel would be so interesting and so important for the other members of the Committee as well as for our local community, is that we think that this is a jewel—our universities are jewels that are not being appreciated or properly utilized in terms of the talent that we have in these enclaves reaching out with their expertise, with their technology, with their ideas, to help bring a good idea to the factory or to the marketplace; whether that be the knowledge that both you have or whether that be the expertise that we have in laboratories on university campuses, whether that be the way that—I will use Notre Dame for this example, since I went to the University of Notre Dame, that Notre Dame's very, very close working relationship with the National Laboratories, with Argonne, that we need to look for ways by which these federal laboratories work in concern with our universities to produce products, maybe not the next B-2 bomber but the next high-definition television or fiber optic cable that helps us get into all our homes with information services or the next ceramic engine. This is an idea that is very near and dear to the heart of one of the chairmen of the Science, Space and Technology Subcommittees, Mr. Valentine. Again, his interest goes into a competitiveness bill that will seek to better utilize our universities in local communities and with national laboratories and with businesses and factories.

Finally let me just conclude and introduce our expert panelists here on what we are also trying to work with on the Science, Space and Technology Committee, and that is look at the possibility of expanding the Malcolm Baldridge award, which is awarded now primarily and solely to businesses that excel in quality production, to where I have drafted legislation to expand it to universities and educational institutions that help businesses become better in the workplace and better in the competitiveness areas. We recognized the talents of individuals like you and your contributions to creating jobs in local communities and the direct correlation thereof.

So with that, let me introduce Dr. Tomal and welcome you. I appreciate your time and again, I ask unanimous consent that all of your statements be entered in the record and that you feel comfortable either by proceeding by reading your prepared testimony or diverting from it whenever you want to. Feel comfortable with that. Dr. Tomal.

STATEMENTS OF DR. DAN TOMAL, PURDUE UNIVERSITY, TECHNOLOGY ENGINEERING DEPARTMENT AND DR. ANTHONY HYDER, UNIVERSITY OF NOTRE DAME, ASSOCIATE VICE PRESIDENT OF RESEARCH AND PROFESSOR OF AEROSPACE ENGINEERING

Dr. TOMAL. Thank you very much. And thank you, Steve, also.

I would like to first begin by indicating that if you see any unusual hand movements or gestures on my part, you have to remem-

ber that I am a professor and I am always seeking a board or a flip chart, as my colleague will probably recognize.

Mr. ROEMER. If you want to use the chalkboard behind us, feel free to do that.

Dr. TOMAL. Okay, thank you.

I would like to begin by taking a look at a way in which America can achieve high-technology competitiveness and focus on basically two ingredients, and that is technology and people. In order for companies to advance, we must recognize the need for change. We have to be able to develop and implement new technology and successfully work together, labor and management, within an organization to do that. The ability for people to effectively adapt to change, employ new technology determines not only the company's success but ultimately its mere existence. We could cite many, many examples of that point.

With that basic premise, people need to develop an expertise in what we can refer to as basic self-management skills. And self-management skills consist of competencies in such areas as critical problem-solving, decision-making, creativity, communications, planning and organizing, relationships, values, integrity, managing change and conflict, teamwork and those kinds of things.

Developing self-management skills in people has been a missing link in education and in many companies. If we look at traditional teacher preparatory programs, we often see training in content, such as mathematics—you know, you learn algebra and geometry and so forth, and on the other hand, you get training in designing lesson plans, how to teach. The missing link in that triangle often is once you get in that school system, how do you manage kids, how do you deal with the stress, the continued changes. How do you plan and organize, make decisions, solve problems and those time management, efficiency kinds of things.

Likewise in business, we have a lot of good workers and they may have an incredible expertise in developing engineering type programs; however, if they have—if they do not have the skills to effectively solve day-to-day problems and synergistically work with their team members, you will never get the new technology actually developed and implemented.

The specific type of courses and training sessions based upon self-management skills could be conducted in half-day, full-day, semester-long type programs in both education and in industry. And those types of programs should not be integrated in existing courses. One, I am afraid teachers do not understand these skills anyway and a lot of business people do not either. So you should kind of teach this separately. In other words, have a course in (1) problem-solving and decision-making, how do you go through the process of actually solving problems, what are the barriers, what things go wrong, and then how do you make decisions for complicated matters such as what we do continually.

Another type program would be in the area of creativity. I think it is fair to say that most people understand or will accept the fact that through our educational process, we often loses a lot of our creativity. They say—different statistics, 97 percent or so of our creativity is lost by the time we are ten years old, those kinds of

things. So the ability to enhance personal creativity is real important in business.

A couple of other examples of topics would be like planning and organizing, how to effectively plan, organize, team effectiveness my goodness, we could talk forever. A lot of my consulting is done just in that area, whether it be a bank or a foundry or so forth. There is a big problem with people working together and I am—quite often I come in to help try to develop team-building and that sort of thing. And it is amazing how that gets in the way from just, you know, forging ahead, especially with labor and management.

Another area is basically interpersonal relationships and integrity, personal time management and organization, those types of topics. Another one is managing change. I think in order to be very competitive, people need to be able to (1) recognize the need for change and not fear it. There is a big fear and resisting of change. They like status quo. And so you have to have the ability for people to understand, recognize it and have the skills to know how to implement change. Also, along with managing change, you are managing conflict, you know. There is a lot of conflict that exists and how to use that positively versus negatively is important in school systems as well as business.

And my last one would be communication. Basic courses in interpersonal communications and developing good speaking through writing and so forth. My experience is I have seen that perhaps to be number one as a ranking for success in business, your communication skills.

The current status of training development—I think we are moving in the right direction, you know, with the SCANS report, the government's America 2000, that is good stuff, it looks like we are moving in the right direction. However, I would caution that we not try to integrate that material with existing courses again, and we try to keep these specific skill areas, self-management skill areas, separate. And one is do not assume that the teachers can just integrate the SCANS material and assume they have this knowledge and skill because they probably do not. I have never seen it in any higher education teacher preparatory program. That would be one thing to take a look at.

The other thing, as I move towards the summary would be in business, some of the larger corporations like duPont and, you know, the Marathon Oils and other types of companies like that, they have been doing these kinds of training programs and trying to teach their people at all professional levels these kinds of skills. And I think there has been some success in doing that and they have seen some benefits. However, of course, as we know, as the economy affects corporations, quite often that may be a reduced area to look into. We have to focus on our production and so forth.

So I think in summary, the myriad of things that we could talk about regarding work force education and training—I tried to focus on just one simple thing here today and that is to develop self-management skills that would not only have a big payoff in the work force, but I think would help people personally and socially; marriages, resolving conflicts, that whole thing of time management and managing things, making change, making decisions. That thing is real important, I think, making health decisions and so

forth, you know. And for some reason, I think that was that missing link, as I started out with.

So basically in conclusion, America has a bright future. We have tremendous people and talents and I think education, self-management could be that infrastructure for building people to meet the challenge.

Mr. ROEMER. Thank you very much, Dan. Steve and I were just laughing about the fact that we would love to get you to come to Congress and teach people in Congress not to be afraid of change as well. That is something we need a lot of in Washington, D.C. and I think there are some people there that are afraid of change, are afraid of risk-taking and new ideas. Steve and I were also joking about if it was not a required course, I wonder how many people would sign up for it. A lot of Congressmen and Senators need to take that course as well too, you would be a valuable asset in Washington.

Dr. TOMAL. I think if they were to look at even their own offices and how they run and what is hindering them from being innovative and competing, one of the things might be the same kinds of things that might be hindering business and education; that is that ability to be efficient, to deal with the team players, planning, organizing, making decisions and doing those things without making the mistakes, working as a team versus working against each other, all those kinds of things.

[The prepared statement of Dr. Tomal follows:]

CREATING HIGH-TECHNOLOGY COMPETITIVENESS THROUGH WORKER TRAINING AND DEVELOPMENT

Daniel R. Tomal, Ph.D.
Assistant Professor
Organizational Leadership and Supervision
Purdue University North Central
Westville, IN 46391

A Paper presented at
the Hearing before the Subcommittees on
Energy and on Technology and Competitiveness
U.S. House of Representatives
Elkhart, Indiana
August 28, 1992

Achieving high-technology competitiveness, in its most basic sense, is dependent upon the quality of two ingredients: technology and people. In order for companies to advance technologically, its people must have skill in recognizing the need for change, developing and implementing new technology, and successfully working together within an organization. The ability of people to effectively adapt to change and employ new technology determines not only a company's success but ultimately its mere existence.

Role of Training and Development

With this basic premise, people need to have expertise in what can be referred to as "**Self-Management Skills.**" Self-Management Skills consist of competencies in such areas as critical problem solving and decision making, creativity,

planning and organizing, interpersonal communications and relations, values and integrity, time management, managing change and conflict, and teamwork.

Developing Self-Management Skills in people has been a missing link in both education and many industries. For example, a worker may have incredible knowledge in his or her field, but unless he or she has developed an expertise in critical problem solving and in working with fellow team members, he or she may never be capable of solving day-to-day work problems and synergistically working with both labor and management in implementing any new technology.

Self-Management Skills can help the workforce more effectively become change agents in managing the high-technology environment that is critical to our country's continued success in this global economy. The role of training and development should be to insure that the workforce, both in education and in industry, develop these Self-Management Skills.

Core Self-Management Training Skills

Specific courses and training sessions based upon Self-Management Skill topics can be conducted as half-day or full-day sessions or as an entire semester curriculum. In order to maximize learning comprehension and skill development, these topics should be taught as a "stand-alone program" vs. attempting to integrate this content into existing training and educational programs. Some of the Self-Management Skill topics include:

Creativity -- The ability of workers to be creative and

think of new and improved methods of performing work and developing new products and processes is paramount for organizational growth. Learning specific individual and group strategies for being more creative, how to enhance personal creativity and transfer this knowledge to work are content areas.

Problem Solving and Decision Making -- Identifying barriers to effective problem solving, troubleshooting problem areas, discovering new opportunities, and making effective decisions based upon a logical and systematic approach are skills important for organizational improvement.

Planning and Organizing -- Workers can benefit from understanding how to overcome obstacles that hinder effective planning and organizing. Specific steps and strategies for planning and organizing can be learned.

Team Effectiveness -- Working together with good interpersonal relationships, communications, mutual support, and teamwork is essential for the organization. Labor and management need a team approach to maximize their energies and talents.

Interpersonal Relationships and Integrity -- Understanding the importance of individual differences and values and respecting each team member is critical for an organization, given the diversity and heterogenous work organizations of today. Workers can learn how to utilize these cultural and value differences to the organization's advantage rather than to its disadvantage.

Personal and Time Management -- Every worker can profit from

managing their time effectively. Learning to avoid time wasters and employ time-effective techniques are important for optimum productivity and quality of work. Understanding and managing personal stress is also important for worker health and effectiveness.

Managing Change -- Change is inevitable and essential for survival. Understanding how to recognize the need for change, to accept rather than oppose it, and to successfully manage change are qualities everyone in an organization must have.

Managing Conflict -- All organizations have a certain amount of conflict, and knowing how to manage conflict positively vs. negatively is important. Understanding various types of conflict within an organization and conflict resolution strategies can be learned and developed.

Interpersonal Communications -- Effective communications is the heart of interactions among workers. The ability to listen and communicate effectively can reduce conflict and increase creativity and productivity. Specific communication techniques can be taught.

Current Status of Training and Development

Education is just beginning to move in this direction as evidenced by the recent U.S. Department of Labor's SCANS report for America 2000. Education should be encouraged to train both teachers and students in these Self-Management skill areas. Developing these competencies not only will help people become more technologically capable, but will also help them manage

their own lives personally and socially.

Some corporate companies have instituted Training and Development programs based upon these areas. Yet, as critical as Training and Development is to the development of the workforce and ultimately to the success of our economy, many companies as well as educational institutions have had to reduce their educational programs as they struggle to survive in today's economy. This, in itself, can lead to stagnation, the very threat to our growth and competitiveness.

Summary

Industry and education need to continue to develop their workforce with the necessary competencies to meet the demands of high-technology competitiveness. America has a bright future if we can tap into the tremendous talents of our people. Education and Training and Development can be the infrastructure for building our people to meet this challenge.

References

Steinburg, C. (March, 1992). Taking Charge of Change. Training and Development Journal, 26-32.

Goodlak, J. (1983). A Study of Schooling: Some Findings and Hypotheses. Phi Delta Kappan, 64 (7), 465-470.

U.S. Department of Labor (April, 1992). Learning a Living: A Blueprint for High Performance. A SCANS Report America 2000. Washington D.C.

French, F., Bell, C. (1973). Organization Development. Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

Ciampa, D. (1992). Total Quality. Addison-Wesley Publishing Company, Reading, Massachusetts.

DANIEL R. TOMAL

Biography

Dan received his B.S. and M.A.E. degrees in Industrial Education from Ball State University in 1974 and 1975. He earned his Ph.D. in Educational Administration & Supervision from Bowling Green State University in 1981.

Dr. Tomal has eight years of experience in education having taught in nearly all levels, including high school, junior college, adult education, and university. He worked for seven years in corporate business as a management consultant for Marathon Oil Company. He then worked for four years as an administrator and self-employed business manager in the health industry. He is currently Assistant Professor of Organizational Leadership and Supervision at Purdue University North Central, where he has a special interest in worker productivity, organizational development, and public health care. He has consulted for numerous companies such as General Electric, Teledyne, LaPorte Hospital, Speedway, USX, Whirlpool, LaPorte Bank and Trust Company, and London Hancock Shipping Company.

Dr. Tomal has authored five books and over 50 research studies and articles for such journals as The School Administrator, Journal of Epsilon Pi Tau, Educational Leadership, Journal of American Vocational Association, Journal of Industrial Education, Training Today, Safety Engineering, and Supervision. He holds life licenses in the State of Indiana in Industrial Education and as Director of Vocational Education. Dr. Tomal has also given many presentations world-wide and has made guest appearances on several national television shows, such as NBC "Cover to Cover," CBS "This Morning Show," the "Joan River's Show," and CBN Pat Robertson's "700 Club."

Mr. ROEMER. Well thank you and we will come back to questions. You have generated a lot of interesting ideas.

Dr. Hyder, if you would proceed with your testimony.

Dr. HYDER. My thanks to you, Congressman Roemer and to the Committee for a chance to give this testimony and opportunity to speak with you and Dr. Borleske this morning.

Let me start by reminding us that we in the United States are capable of building on some remarkable strengths. There is a long history of substantial investment in basic research, an infrastructure of 10-15 million companies, an entrepreneurial culture that is unique in the world, the world's largest trained pool of scientists and engineers and one that is served by a common single language, which is also very important.

In continuing my comments this morning, rather than to stick with my testimony, I would like just to extract a couple of points that I think need highlighting from that testimony and let us go from there.

The first point relates to the picture that I have included in the testimony. It is a simple model that I use to try to organize my thoughts. The model is that of a life cycle of a product or a process and I view it as occurring in three separate stages. The first of these is a basic research phase in which the new idea is given birth, often by people who have no appreciation at all of its commercial value. These research activities take place in many venues. Among them, industrial laboratories, the national laboratories, and of course academic settings.

The second phase, and one that I think has proved most troublesome to us in this country, occurs when one tries to take that concept out of the laboratory and move it into the marketplace. It seems to be a bridge that we have difficulty crossing as a culture, if not as a nation.

The last phase describes the production and eventual retirement of the product or process as a new idea comes on board to replace it.

If we were to look at these three processes on a graph that plots the amount of effort that is expended in each of those phases, my view is that we would see a great deal of effort expended in the basic research phase of the concept. The level of effort applied to that seems to decrease as we move into the development and prototyping of a concept or process based on that basic research idea and the level of effort increases again as industry gets involved in evaluating and producing and commercializing the item.

The point that I want to make is that to remain competitive, we have to remain competitive in all three phases of the life cycle. And along that line, let me just make two points. One is that international competitiveness is not simply restricted to the production and commercialization of the product. It is not just restricted to industry. The U. S. academic community, which has long enjoyed international pre-eminence in research, is in jeopardy, not unlike the situation facing the industrial sector. Research is the driving force behind high-technology activities and in many cases, academic research is the source of the next generation of ideas that fuel this life cycle process. Unless there is a continuous bolstering of resources supporting academic research, there is the inevitable de-

crease in the generation of new knowledge upon which technology is based. The research universities are key to competitiveness not only through their research activities but as you know, equally important through the education of the next generation of technologists and scientists and business leaders and entrepreneurs.

So whatever solution is considered for U.S. competitiveness, it must include increased support of academic research, which is the life's blood of this process. Good ideas simply cannot be ordered up as so many pancakes at an all-night diner, as I say in my prepared comments. They must flow from the insight, the innovation, the perception and the genius of the researcher. But this point seems not to be understood universally. I am disturbed by the erosion of the infrastructure of academic research in this nation and by activities in the Congress such as the recent instructions to the National Science Foundation that investigator-initiated research—investigator-initiated research—be limited and that NSF promote education and economic competitiveness projects at the expense of basic science. The long term impact of this erosion, I fear will be devastating.

I will simply reiterate again that as a nation, we do not do an adequate job of transferring technology from the laboratory to the production floor. I think that that gap in the effort curve is going to have to be addressed by a national strategy involving industry, government, the national labs, academia, all players, because everyone touches that gap from one side or another and all must be part of the solution.

There are some topics that the Committee may wish to consider as items that potentially foster successful development and exploitation of technology and I would like to just mention two, leaving the rest to my written statement.

One is that it is not fair to judge ourselves harshly in saying that we have never been able to bridge that gap in this nation because there are some very good examples in this country where we have done that. Government support and collaboration with both industry and academia and technology development has been successful in the aviation industry, in agriculture and most recently in the use of communication satellites. But there are other opportunities that we simply have not pursued. There has been a widespread failure to follow up on government supported world class basic research with exploratory development and technology demonstration efforts with the result that foreign companies, rather than U.S. industries are exploiting American technological advances.

Let me conclude my oral comments simply with one final comment regarding the protection of intellectual property because I feel very strongly on this issue. As I said, academic research is really a source of much innovation in this country. The federal government funds most academic research in the United States. In virtually all cases, the government will allow the academic institution to hold the patent on the results of that research with the provision that government will have royalty-free access to the innovation. Unfortunately, for the overwhelming majority of institutions, the cost of filing for patents is prohibitively high. In my written comments, I said that for many institutions that institutions is prohibitively high. I would like to correct that and say for the over-

whelming majority, $20,000 is a lot of money. The result is that much innovation that comes from this government-sponsored academically-based research, much innovation is not protected or is abandoned to the public domain and so flows unencumbered to those who would be our competition. One possible solution for this would be for Congress to consider allowing all federal research grants and contracts, especially those at academic institutions to carry a provision allowing for recovery of patent filing costs in an effort to protect innovation resulting from funding from the federal sources, from flowing outside of our borders.

I think I will close with that and join with Dr. Tomal in addressing any questions you or Dr. Borleske may have.

[The prepared statement of Dr. Hyder follows:]

TESTIMONY

PRESENTED TO
THE UNITED STATES HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

REGARDING
U. S. NEEDS TO EFFECTIVELY COMPETE IN HIGH-TECHNOLOGY MARKETS

BY
ANTHONY K. HYDER, PH.D.
ASSOCIATE VICE PRESIDENT FOR RESEARCH AND
PROFESSOR OF AEROSPACE ENGINEERING
THE UNIVERSITY OF NOTRE DAME
NOTRE DAME, INDIANA 46556

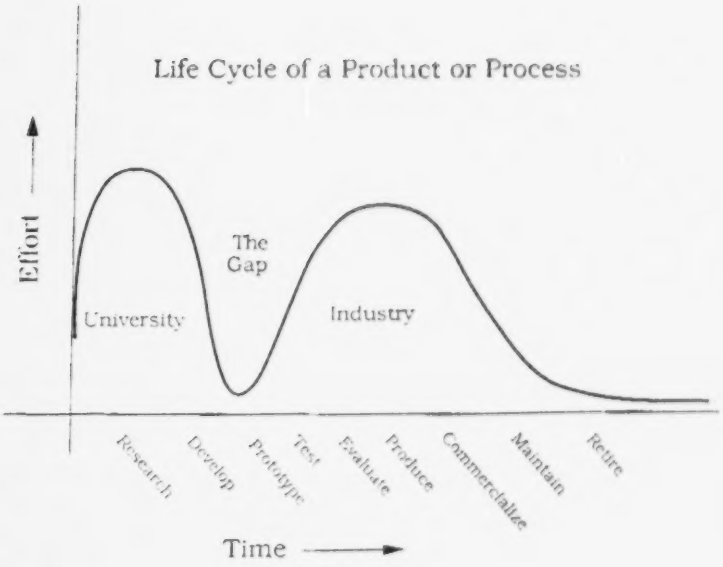
Thank you for this invitation to address the Committee on an issue which, like all difficult and important problems, is much discussed but as yet not successfully resolved: the needs of U. S. industry to effectively compete in high-technology markets.

Let me start by reminding us all that although there are some difficulties, the sky is not falling. We in the United States are capable of building on some remarkable strengths:

- -- a long history of substantial investment in basic research.
- -- an infrastructure of 15 million companies involved in every known discipline.
- -- an entrepreneurial culture that is unique in the world.
- -- the world's largest trained pool of scientists and engineers and one that is served by a single common language.

In these few minutes, let me use a simple picture as a way of organizing my thoughts. The life cycle of a product or process can be viewed as occurring in three stages. The first of these is the basic research phase in which the new idea is given birth, often with no appreciation of its potential for commercial exploitation. These research activities take place in many venues-- industrial laboratories, national laboratories, and, in this country, most frequently in university laboratories. The second phase, and one that has proven most troublesome, is the transfer of the idea out of the laboratory and into an arena which will allow its commercialization. The last phase describes the production and eventual retirement of the product or process upon the arrival of an even newer idea.

If these activities were to be viewed on a time line and at each phase some measure of the level of effort devoted to that phase were indicated, the resulting picture emerges:



There are several points that can be drawn from this simple model:

1. International competitiveness is not restricted to industry. The US academic community, which has long enjoyed international preeminence in research, is in jeopardy, not unlike the situation facing the industrial sector. Research is the driving force of high-technology activities. It is the source of the next generation of ideas that fuel the process. Unless there is continuous bolstering of resources supporting academic research, there is the inevitable decrease in the generation of new knowledge upon which technology is based. The research universities are key to competitiveness not only through their research activities, but equally important through the education of the the next generation of technologists, scientists, engineers, entrepreneurs, and leaders of business. There is no wiser dollar spent than the dollar spent on education. As the saying goes, if you think the cost of education is high, have you recently checked on the cost of ignorance?

Whatever solution is considered for US competitiveness, it must include increased support of academic research from which the life's blood of industry flows. Good

ideas cannot be ordered up as so many pancakes at an all-night diner. They must flow from the insight, innovation, perception, and genius of the researcher. This point seems not to be understood universally. I am disturbed by the erosion of the infrastructure of academic research in this Nation and by activities in the Congress such as the recent instructions to the National Science Foundation that investigator-initiated research be limited and that the NSF promote education and economic competitiveness projects at the expense of basic science.

2. As a Nation, we do not do an adequate job of transferring technology from the laboratory to the production floor. This is the gap in the effort curve. Scientific discoveries are not converted into products and we continually allow foreign companies to reap the benefits of our basic research. Not only is the government not organized to support partnerships to bridge this gap, but, rather, it takes an adversarial role in many instances. We in the United States are trying to compete with companies whose governments directly support the development of new products and processes by forming and fostering the partnerships necessary to bridge the gap.

3. Industrial management takes a short-range outlook directed at quarterly profits. This outlook is not compatible with strategies needed to support long-term research and development. A patchwork approach to bridging the gap and carrying through on the necessary development and testing needed to bring high-technology products and processes to market won't do. Rather, we need a national strategy to address the cradle-to-grave life cycle, research to retirement of the product, or otherwise we'll all be back here next year and the year after looking for another partial solution.

4. The solution does not rest exclusively in the federal laboratory system. They are players to be sure, but they are not commercial in their culture and have never been forced to fight in an entrepreneurial arena for their livelihood. They have done well in the things they were chartered to do, but fostering US high-technology industrial competitiveness isn't one of them. The federal laboratories should be considered in the overall strategy of national competitiveness, but not as the centerpiece and certainly not as they are structured today. Like all other players in this arena, they should address their need to maintain those technical activities that are national centers of excellence and eliminate those portions whose charter has passed.

5. The gap is also a result of our technology management structure. US industrial competitiveness is dependent upon sustained investments in knowledge-intensive, high value-added, technology-driven systems. Unfortunately, Federal monetary, fiscal, regulatory, and investment policies have been stifling to international competitiveness.

There are some topics that the Committee may wish to consider as items that potentially foster the successful development and exploitation of technology. As examples:

1. Government support and collaboration with industry in technology development has been successful in aviation, agriculture, and communication satellites, but there are other opportunities that have not been pursued. There has been a widespread failure to follow up on government supported, world-class basic research with exploratory development and technology demonstration efforts with the result that foreign companies rather than US industries are exploiting American technological advances.

2. As a Nation and as a culture, we must overcome the industrial management reluctance to think long-term by, perhaps, implementing such incentives as a zero capital gains tax for long-term investments; targeted investment tax credits for pre-competitive, generic critical technologies; accelerated depreciation based on production output; R&D tax credits, and enhanced tax credits for corporate investments in academic research.

3. Anti-trust laws are a century old. The 1984 modification to those laws paved the way for 250 collaborations to be registered with the Justice Department. The modifications limited collaborations to R&D. The time is right for extending those modifications to manufacturing to allow, for example, shared, flexible, automated facilities to be created.

4. The body of laws governing liability encourages punitive damages and class action litigation whose primary effect is to discourage businesses from taking the risks essential to innovation and technology development.

5. Let me end with a final comment regarding the protection of intellectual property. The Federal Government funds most of the academic research in the US. In virtually all cases, the Government will allow the academic institution to hold patents on the results of the research with the provision that the Government will have royalty-free access to the invention. Unfortunately, for many institutions the cost of filing for patents is a prohibitively high expense. The result is that much innovation is not protected or is abandoned to the public domain, and so flows unencumbered to those who would be our competition. All Federal research grants and contracts, especially to academic institutions, should carry a provision allowing for recovery of patent filing costs in an effort to protect inventions resulting from funding from Federal sources.

In closing, I wish to bring to the Committee's attention a informative monograph that I used in the preparation of part of my comments: "Technology: The Engine of Competitiveness" prepared by The Center for Security Policy.

Finally, I again thank the Committee for its invitation to present testimony on this critical topic and hope that these thoughts assist you in the difficult tasks you have undertaken.

Anthony K Hyder

Business
Associate Vice President for Research
312 Main Building
Notre Dame, Indiana 46556
(219) 239-8591 239-6620 fax

Residence
51963 S. Shoreham Ct.
South Bend, Indiana 46637
(219) 271-1804

Scientific Education

PhD	1971	Nuclear Physics/Aerospace Eng	Air Force Institute of Technology
MS	1964	Space Physics	Air Force Institute of Technology
BS	1962	Physics	University of Notre Dame

Experience

(1991-) Associate Vice President for Research and Professor of Aerospace Engineering, University of Notre Dame, Notre Dame, Indiana. Responsible for the development and administration of the research activities of the University; for strategic planning and formulation of University policy related to research, industrial activities, and research compliance issues; and for representing the University on research-related matters.

(1982 - 1991) Associate Vice President, Office of the Vice President for Research, and Associate Professor of Physics and Aerospace Engineering (tenure), Auburn University. Responsible for developing the research capabilities of the University at large, for strategic planning and formulation of policy related to research, and for the administration of research programs. Represents the University and the Vice President for Research on- and off campus on all research related issues. Research grants and contracts exceeded $26 million in FY 90, and expenditures for research during FY 90 exceeded $60 million.

(1981-1982) Scientific Adviser to the Director for Research, Office of the Secretary of Defense (Research and Advanced Technology), Washington, DC. This office develops policy and exercises implementation oversight for all basic research supported by the Department of Defense. This program exceeded 700-million dollars in fiscal-year 1982. This office establishes policy for the one billion dollar Defense Industrial Research and Development Program.

Accomplishments

Founded the Auburn University Space Power Institute and Center for Advanced Technologies which draw together more than 40 faculty and 50 graduate students in 15 universities to address space-technology research needs. This has become one of the most robust research establishments in the Southeast United States. The work is particularly relevant to the success of essential space systems such as space based radar. Founded the inter-agency space power community.

Established a coordinated multimillion-dollar, multi-disciplinary research program involving 40 university faculty at 25 institutions to advance the Nation's particle-beam technology base.

Nominated by Congress for the 1987 Department of Commerce Medal of Technology. (One of fifty nominees nationwide.)

Received the United States Air Force Research and Development Award for 1974. (No more than five awards are presented annually.)

Government Advisory Panels

Strategic Defense Initiative Organization, Office of Technology Applications, Power Panel, Chairman, 1988-continuing.

(Air Force Scientific Advisory Board, member, Science Panel and Space Cross-Matrix Panel, 1990-1994.

Air Force Scientific Advisory Board, advisor, Committee on Space Power Technology, 1989-1990.

Technical Activities

Directing

NATO Advanced Studies Institute on High-Brightness Accelerators, Pitlochry, Scotland.

NATO Advanced Studies Institute on the Behavior of Systems in the Space Environment, Pitlochry, Scotland, 1991.

Committee Memberships

Third through Seventh International IEEE Pulsed Power Conferences, 1981-1991.

Fifth International Topical Conference on Electron and Ion Beam Research and Developments (Beams '83)

NATO Advanced Studies Institute on Fast Electrical and Optical Diagnostics Techniques, Castlevecchio, Italy

NATO Advanced Studies Institute on Radiative Processes in Discharge Plasmas, Pitlochry, Scotland

Soviet Exchange

Participant in the science exchange program of the Soviet Academy of Sciences in 1988, 1989, and 1990. Traveled extensively throughout the Soviet Union as a guest of the Soviet Academy, visiting/lecturing at research institutes in Moscow, Leningrad, Dubna, Sverdlovsk, Tomsk, Gorkii, and Novosibirsk.

Professional Societies

Institute of Electrical and Electronics Engineers, Senior Member
American Institute of Aeronautics and Astronautics, Senior Member
American Association for the Advancement of Science
National Council of University Research Administrators
Society of Research Administrators
Sigma Xi (Research Honor Society)
Tau Beta Pi (Engineering Honor Society)
Sigma Pi Sigma (Physics Honor Society)
Omicron Delta Kappa (Leadership Honor Society)

Publications

Over 60 technical publications. A full listing of publications is available upon request.

Mr. ROEMER. Thank you very much, Dr. Hyder. Thank you both for very, very interesting testimony that I think again, as the first two panels did, that members of Congress will be very, very interested in seeing and talking about as well too.

Dan, let me follow up on an areas that you brought up in terms of training people in these types of skills that you feel there is a real paucity in right now, that we are not doing an adequate job, in your testimony; managing change, managing conflict, interpersonal communications, team effectiveness. We are seeing many of these things utilized now by some members of industry and business. The Saturn plant, for instance, down in Tennessee is utilizing some of these new innovative ideas. I read an article last night in FORTUNE magazine talking about Lee Iacocca's retirement coming on. He keeps on delaying it but I think it is going to finally come around, and he says that some of these things that you talked about are being incorporated. Do you see though generally that industry is moving in this direction to be receptive to these kind of things? And also, if you were not here you should have heard two people from industry on the first panel from AM General making the Hummer, say precisely what you said, that the basic education that we need to provide, especially at the high school level needs to be more involved in problem-solving skills, computer skills, work ethic, team effectiveness kind of things, so that if the job requirement changes, these people can change with it, or instead of working on an assembly line, these people work in teams to cut costs and come up with innovative ideas for the future.

Again, coming back to your premise, how is industry—are they receptive to this, are they utilizing these techniques? And then about schools, are they teaching it in the business schools? Are they teaching it in the high schools?

Dr. TOMAL. Thank you. I do not believe that in secondary school systems, they are really doing anything like this, and I think that that is one area where we can help prepare high school students to meet the demands of the work force area, if we could teach these kinds of things. I do not think they are doing a lot of in-service training these days either. I think that they could do more in-service training and I think prepare the teachers to be able to teach these kinds of competencies and skills, we would be in a better position, so when the students do get into the work world, they have these skills. So I think that is needed desperately.

Business, in terms of your question, a lot of the larger corporations are doing this and I think they are very, very receptive, all organizations I think are, and I believe that one way to help foster that would be working with, you know, local institutions such as Notre Dame, Purdue in terms of tapping into some of the expertise that the professors have in working with them. Such as AM General indicated, it is always good when the Section 127, you know, the help in that regard and any types of assistance, educational assistance in furthering, is always beneficial, I think.

Mr. ROEMER. Where would a business go, if you are familiar, in northern Indiana, in South Bend, Elkhart, West Lafayette, if they were interested in taking on some of these challenges to learn these skills, and they are not a big business like the Hummer? What if they have a small business of 49 employees and they find

they want to learn more and challenge their employees and adopt these new techniques? Where would they go? Would they come—is that available at a center like this in Elkhart?

Dr. TOMAL. Yeah, I think primarily where they are going now is continued education places. You know—

Mr. ROEMER. Work force development?

Dr. TOMAL. Yeah, they are booming these days and I think a lot of the institutions have gone to the continuing ed departments and they have done very well traditionally for the smaller companies to help meet these needs and then perhaps, you know, to some individual professors more. I am not sure if you can actually always get these skills by enrolling in any curriculum or program necessarily.

Mr. ROEMER. I guess the next question becomes what is the federal role or is there a federal role in this type of training.

Dr. TOMAL. I think a couple of areas would be the ones we already talked about, you know, and what support that can be done for companies to further educate their people, you know. We have kind of talked about that is always good. And then perhaps I wonder if—I am not very familiar at all, you know, with the government's educational department and what all they are doing there. And I am wondering they are doing much in this area of the self-management type, you know, skill-building and so forth. Certainly they are doing some areas in the SCANS area, you know, by promoting this, but that is a whole different kind of thing. And so it would be interesting if one could bring to the attention of the Education Department to develop some curriculum in these specific content areas, and then maybe to pilot it with companies and to see how successful it is. That would be something that would maybe be a role the government might do in an attempt to see how valuable and beneficial this could be in helping the work force adapt to change and be more competitive as opposed to just focusing on developing new technology, focusing on how people can recognize the need for change and develop the problem-solving skills to do all these kinds of things.

Mr. ROEMER. Thank you.

Dr. TOMAL. Sure.

Mr. ROEMER. And we will continue to keep our eye open for that type of educational program and potential and opportunity as well too.

Dr. Hyder, let me ask you a couple of questions, specifically on the second page of your testimony here, with reference to your diagram here, the life cycle of a product or process. We have heard so much testimony about this gap, this hiatus between R&D where we feel like the United States is second to none in the world, and so few people even mention the prototype and the testing and the ability of government and the academic sector and businesses to work together there, and then we come right back again to the marketing techniques that are strong in this country. But we are very big on the research and not very good on the development part of it.

Again, I think we could talk for hours about this, reasons why, is it a function of this or that and what variables are included in creating this gap. What are some of the efforts that we are making to

address this gap, both at the university level, at the business level and at the federal government level? How are we seeking to strengthen the prototype and the testing areas here? And you said that there are some successes there in aviation and agriculture and communication satellites. What can we learn from those successes to apply to other areas? Let me start there.

Dr. HYDER. Where? Let me try to answer it by going back to the aviation industry as a model. And I think that will point out one of the problems that I see. With aviation, the reason that we were able to go the entire spectrum cradle-to-grave, from basic research on an air frame or a new engine, on a new turbine, on whatever, avionics, all the way until that aircraft is retired from inventory, like the DC-9 probably will be this year, is because there was within the federal structure a single agency interested, and that was the Defense Department. The Defense Department wanted high-technology aircraft, they went to the aviation industry, they funded the research, they funded the prototypes, the testing, the development function. The aviation industry then took spin-offs from those military designs and commercialized them. I am sure you flew in one of those on the way to South Bend this week.

If one looks at where else someone might go, in another research area, to look for this support from beginning to end, it does not exist. It exists in agriculture to some extent, but in micro-electronics, in high definition TV, the researcher perhaps would go to the National Science Foundation for basic research, but if it got past the basic research stage to the point that you wanted to prototype it, NSF would say no, that is not our mission. If you go to another agency whose mission it might be, you run into the "not invented here" syndrome. If it was good enough early on, why did you not talk to us, Catch-22.

I think one of the limitations is the structure overseeing the distribution of government research and development funds and I am not sure how one solves that. I think it is important to maintain the NSF's basic science, basic engineering.

Mr. ROEMER. Let me just interrupt because you are making an interesting point and I want you to continue. In your remarks you also said that it seems that Congress is moving in the direction of emphasizing through competitiveness the basic application rather than the basic science and research. Is it one versus the other or is it both? From your indications on defense, it has been that government did both and therefore private industry really benefited from that.

Dr. HYDER. I think it is one against the other now because of limited resources. And it is a difficult call to make, but I think the call is within a shrinking federal budget, how does one allocate resources across this life cycle. And it is almost as if we are attacking it in a crisis management mode rather than sitting back and looking at the total picture and developing a national strategy, a comprehensive well-thought-out national strategy of how do we distribute these resources so that all parts of the life cycle can be help healthy. Not at the level that they would like perhaps but we do not jump from one crisis area to another. And I sense that in the Congressional direction to the NSF, to take money out of basic science or to limit basic science funding to put that money into an-

other area. Without, I think a great deal of thought of what is going to happen five or ten years from now when we realize that ten years previously we have turned off that spigot that is giving us the new ideas that is the driving force of our tech base.

I am not sure that answered your question. if not, I would be happy to try it again.

Mr. ROEMER. No, it brings up even more interesting questions as well too. Do you think then that—I guess you would advocate too that as we in Congress cut back on defense spending, that we have to be very, very careful where we cut back, especially in our application of those expenditures for research and development as it impacts upon the aerospace industry in this country. Can you comment on that and how companies like McDonnell Douglas or Boeing and so forth might be harmed by that kind of meat axe approach to a defense budget?

Dr. HYDER. I would agree with the implication, but I would not restrict it to the aerospace industry. The Department of Defense basic sciences, basic research initiatives, are being shrunk. This includes DARPA, SDIO plus the individual services. Basic research laboratories and that portion of their basic research that they fund extra-murally to their laboratories.

I think when one views the cutback in the Defense Department—and I think that is probably inevitable, we are not going to stop some of those cutbacks—one must view them in the long-term and not jump to today's solution. And in the long-term, I think it is not only prudent but it is essential that we position ourselves so as not to be victims of technological surprise downstream. That would mean promoting the research and to some extent development and perhaps even a prototype of devices, of ideas, of systems, without carrying them to the production stage where, as you know, 99 percent of the money is used, but maintaining the tech base so that if, God-forbid, we were ever forced into a situation of going back into a production stage, we would not have to go back to the far left-hand side of this curve and wait the five or ten years for new ideas to come forward.

Mr. ROEMER. Let me ask you another question about the national strategy idea that you seem to advocate. We are seeing a lot of discussion about this from all people and from all communities. Robert Reitch, an academician at Harvard, has written a book called HOW NATIONS WORK, he is probably seen as somebody more on the democratic side and more toward the left. This book IN THE SHADOW OF THE RISING SUN written by the CEO of a steel company in Pittsburgh, advocates some kind of a national coordinating strategy or trade strategy. We see Norm Augustine, the CEO of Martin-Marietta, saying geez, we are not doing anything right. Let us try something, I do not care if you call it a trade policy or a national strategy, something has got to be better than what we have got because what we have got is not working. He—you know, that is almost his way of breaking it down.

What do you think about a national strategy and how might the federal government help in that national strategy?

Dr. HYDER. I think the federal government would have to take the lead in that national strategy. I am hesitant—I believe in it, I think it is necessary, but I am somewhat skeptical of whether it

would ever come about. I look back at a national energy strategy and I am still looking for that, in spite of the fact that every man, woman and child in this country says we need one. So if everybody agreed that we needed a national strategy on technology, on innovation, on competitiveness, on whatever the term might be, I am skeptical that it would every happen. And the thing that bothers me is if we all sit back and say that the solution to the problem will come about when we adopt a national strategy, that is almost as if we have put the problem on somebody else's table, it is no longer my problem, so I can get along with doing what I wanted to do.

I think that if a national strategy were to come about, it would come about because the administration and the Congress got together and agreed that all other things aside, this is something that has to be done. There are a lot of people a lot smarter than me who could make a contribution to outlining such a national strategy. We are blessed with some very brilliant people in this country, if they are given an opportunity to participate. I think it is something that is needed and I think it is something that rises above politics. That causes me some concern as to whether or not it would ever take place.

Mr. ROEMER. Well I agree with some of your skepticism about whether or not we can do it. We need to reform Congress, we need to possibly elect a Congress and a President of the same party. We do have a national energy policy emerging this fall that we will vote on out of conference and I am fortunate enough because of Chairman Brown, to be a conferee on that bill. But it has left out some of the key components of a comprehensive national strategy, some of the tough decisions we have to make in developing a national energy strategy, and that is because of the paralysis and the problems we have with a divided government. But let us say that Clinton is elected, let us say that those things are worked out in the next few months, what kinds of things do we need to see happen between business and government, not just government or business and the academic sector, what kinds of demonstration projects or things which might happen at Notre Dame might facilitate this process?

Dr. HYDER. Well I think one thing that could be done is for all players in this life cycle chart, everyone from the national laboratories and academia and business and government, and the funding agencies from government, to sit down and indicate in writing what they consider the problems to be and to look at what they think the solutions might be in a comprehensive, no-holds-barred fashion. And a subset of that group then sit down and attempt to draft solutions that might take the form of legislation based on not necessarily consensus, but certainly based on participatory activity. I do not believe that we will ever arrive at a national strategy by consensus. Just like I think if you look at the successful management styles of most successful managers, their style is based on participatory management rather than consensus management.

I think that at some point, based on the participation, the active participation, some legislation might be drafted which, as I repeat, may not reflect consensus but might reflect the best chart—chart the best course for the nation. It might involve such things as I

have indicated here, and I go back, for example, a relook at antitrust laws, and the 1984 modification which allowed participation, collaboration at the research level extending to the production level, for example. It might involve making it advantageous for industry to look past the quarter profit statement by implementing incentives such as those that I have mentioned in here. The only one that I would mention again is perhaps an enhanced tax credit for corporate investment and academic research. It would look at the body of laws governing liability. I think that was mentioned earlier this morning by the gentleman from AM General.

Mr. ROEMER. Right.

Dr. HYDER. It would look at those technology areas and those research areas that we as a nation think we have an advantage or a potential advantage in, and perhaps leave to other nations to develop those technologies that we probably would be best staying out of.

It would look at the strength of our national laboratories and ask where are we clearly the world leaders and what parts of those should we absolutely protect. What part of those have served their charter and are perhaps ready to move on.

Mr. ROEMER. Well that is a good place to let me ask my final question, and please feel free to participate as well too. How do you see us down-sizing or restructuring or re-evaluating our federal labs? What role should they assume and, you know, if you want to add to that, what technology should we try to concentrate on?

Dr. HYDER. I think every national laboratory and every defense laboratory—national laboratory I am thinking in the DOE sense.

Mr. ROEMER. Right.

Dr. HYDER. But I would extend that to DOD laboratories also. Each one has its pocket of excellence and I think those centers of excellence in each of those laboratories are a national resource that should be retained and protected and enhanced. But like all universities and like all industries, not all parts of national laboratories are created equal. Some parts are better than others. Those that are not competitive in the international arena should be identified and allowed to serve their charter and expire. Those that are competitive in the international arena should be held up as jewels and protected.

Mr. ROEMER. Any additional comments? I would just like thank you both very, very much for your time and even more so for your patience to be here. I think both of you were here for the first panel and to wait for the last couple of hours to get to your panel. We really wanted to highlight your panel. Members of the committee are probably more interested in this particular testimony from both of you. I know Mr. Valentine is. So we are very anxious to get a lot of this back to Washington, D.C. and please keep in touch with us. And again, I appreciate the time that you have spent, both here this morning and preparing the excellent testimony for the Committee.

Thank you very much, and that brings to a close, Steve, unless you have anything else, the proceedings of this hearing.

Mr. BORLESKE. I would just like to add my comment to the two panelists, that your testimony is very much in agreement with

what we have heard nationally and we very much appreciate your comments.

Dr. TOMAL. Thank you, Steve.

Dr. HYDER. Thank you, Steve.

Mr. ROEMER. Thanks a lot, appreciate it.

[Whereupon, at 12:18 p.m., the Subcommittees were adjourned.]

59-967 (80)

ISBN 0-16-039468-6